ECONOMIC ISSUES IN RETROSPECT AND PROSPECT

Aleksandra Górecka
Altuğ M. Köktaş
Agnieszka Parlińska

IJOPEC
London    ijopec.co.uk    Istanbul

VOL. II
ECONOMIC ISSUES IN RETROSPECT AND PROSPECT

EDITORS
Alexandra Górecka (PhD)
Assoc Prof. Altuğ M. Köktaş
Agnieszka Parlińska (PhD)

SEPTEMBER - 2018
## CONTENTS

### PART I
#### HEALTH ECONOMICS

**PART II. CHAP 1.**
THE EFFICIENCY OF HEALTH SYSTEMS IN MENA COUNTRIES ........................................3
Sıtkıcan SARAÇOĞLU

**PART I. CHAP 2.**
THE CONTRIBUTION OF THE PRIVATE HEALTH SECTOR IN TURKISH ECONOMY: A REVIEW FROM 2002-2017 .............................................................................................................. 15
Ali Gökhan GÖLÇEK

**PART I. CHAP 3.**
OCCUPATIONAL HEALTH AND SAFETY IN HEALTHCARE SECTOR IN TURKEY ........35
Deniz Tugay ARSLAN, Jebağı Canberk AYDIN

**PART I. CHAP 4.**
DETERMINATION AND WEIGHTING OF NON-PRICE FACTORS USING FUZZY ANALYTIC HIERARCHY PROCESS IN THE CONTEXT OF COST – EFFECTIVENESS, EFFICIENCY AND ECONOMY IN HEALTH INVESTMENT PROJECTS SERVICE PROCUREMENT DECISIONS ................................................................49
Orhan PARILDAR, Cagdas Erkan AKYUREK, Sukru Anil TOYGAR

### PART II
#### MACROECONOMICS

**PART II. CHAP 1.**
MONETARIST MACROECONOMIC THEORY IN THE HISTORY OF ECONOMIC THOUGHT: MONETARISM ................................................................. 71
Ayşe ERGİN ÜNAL

**PART II. CHAP 2.**
EVALUATION OF TURKEY’S INDUSTRIAL POLICY WITHIN THE FRAMEWORK OF THE EU-TURKEY RELATIONS ................................................................. 87
Özlem GENÇ

**PART II. CHAP 3.**
POLITICAL CYCLES OF MACROECONOMIC POLICY AND STABILIZATION POLICY ........................................................................................................... 101
Hale KIRMIZIOĞLU
PART II. CHAP 4.
THE SIGN OF PANEL LONG-RUN CAUSALITY ANALYSIS BETWEEN MIGRATION AND POVERTY: THE CASE OF EUROPE..............................................121
Reyhan CAFRI

PART II. CHAP 5.
THE SECTORS TURKEY HAS COMPARATIVE ADVANTAGES IN EXPORTS, POTENTIAL COMPETITORS IN THIS SECTORS AND COMPARATIVE ANALYSIS TO THEM...........................................................................................................135
Kazim SARICOBAN, Elif KAYA

PART II. CHAP 6.
UNEMPLOYMENT HYSTERESIS ANALYSIS FOR MIDDLE-INCOME COUNTRIES .....155
Ali Eren ALPER

PART II. CHAP 7.
THE IMPACTS OF THE EXPENDITURES OF RESEARCH-DEVELOPMENT UPON FOREIGN TRADE, GROWTH AND EMPLOYMENT: A PANEL DATA ANALYSIS FOR 28 EU COUNTRIES .................................................................171
Ahmet KAMACI

PART II. CHAP 8.
USAGE OF THE STATISTICAL APPROACHES IN ECONOMETRICS .........................185
Zeynep ÖZTÜRK

PART III
PUBLIC FINANCE

PART III. CHAP 1.
PUBLIC DEBT A HARPAGON\ FOR PEOPLE: A HISTORICAL VIEW .........................203
Zeynep AĞDEMİR

PART III. CHAP 2.
MATERIAL DEPRIVATION IN TURKEY ...........................................................................215
Altuğ M. KÖKTAŞ, İşıl Şirin SELÇUK

PART III. CHAP 3.
FISCAL POLICY SHOCKS AND HOUSE PRICES RELATION IN TURKEY: A REGIONAL PERSPECTIVE ..............................................................................227
Ahmet AYSU

PART III. CHAP 4.
FISCAL POLICY TOWARDS NATURAL DISASTERS .......................................................243
Emre ATSAN
PART III. CHAP 5.  
FROM LANDLORDSHIP TO PROPERTY ................................................................. 251  
Hulya DERYA

PART III. CHAP 6.  
18TH CENTURY PROVINCIAL ADMINISTRATION OF OTTOMAN  
EMPIRE IN WAR ECONOMY: RAQQA PROVINCE (1730- 1745) .............................. 265  
Tahir ÖĞÜT

PART IV  
TAX LAW and THEORY

PART IV. CHAP 1.  
DERIVATIVE FINANCIAL INSTRUMENTS AND THEIR TAXATION IN TURKEY .......... 291  
Selçuk BUYRUKOĞLU

PART IV. CHAP 2.  
THE EFFICIENCY OF TAX ADMINISTRATION IN TURKEY ...................................... 301  
Hünkar GÜLER, Hacer KABA

PART IV. CHAP 3.  
THE RELATIONSHIP BETWEEN TAX AUDIT AND TAX COLLECTION IN TURKEY:  
ARDL BOUNDS TESTING APPROACH ..................................................................... 317  
Huseyin KUTBAY

PART IV. CHAP 4.  
TIME EXTENSIONS IN TAX PROCEDURE LAW AND ITS RESULTS ....................... 339  
Hakan BAY

PART IV. CHAP 5  
TAXATION OF CRYPTOCURRENCIES IN TURKEY: IN PARTICULAR BITCOINK ....... 359  
Özay ÖZPENÇE, Bilal GÖDE

PART IV. CHAP 6.  
COMPLETION OF FRAUD AS ECONOMIC CRIME .................................................. 377  
Recep KAHRAMAN

PART V  
PRODUCTIVITY

PART V. CHAP 1.  
PRODUCTIVITY AND REAL WAGE RELATIONSHIP IN TURKEY:  
COINTEGRATION AND CAUSALITY ANALYSIS ...................................................... 391  
Sevilay SARICA
PART V. CHAP 2.
THE RELATIONSHIP BETWEEN FERTILITY RATE AND ECONOMIC GROWTH IN MENA COUNTRIES .................................................................415
İşın Kortan Saraçoğlu

PART V. CHAP 3.
TECHNICAL EFFICIENCY OF SUGAR PRODUCTION IN EU AND TURKEY: MALMQUIST AND DATA ENVELOPMENT ANALYSIS APPROACH ...........................................427
Fatih Hakan DİKMEN, Emre Güneşer BOZDAG

PART V. CHAP 4.
The Impact of Technology Investment on Value Added: An Empirical Study on Turkish Manufacturing and Service Sector........ 439
Gül GÜNEY

PART V. CHAP 5.
RETHINKING ON FOOD PRICE SPECULATION IN TERMS OF GLOBAL FINANCIAL CRISIS .......................................................................................455
Bilgen TAŞDOĞAN, Celal TAŞDOĞAN

PART V. CHAP 6.
SMALL AND MEDIUM-SIZED ENTERPRISE COLLABORATION WITH SUPPLIERS FOR INNOVATION .................................................................................465
Mustafa İNCEKARA
PART I

HEALTH ECONOMICS
Introduction

Health, which generates many externalities, is generally defined as a fundamental component of welfare and the driving power of economic growth. The health of the citizens depends substantially on the country’s health system. Hence, a health system should achieve the improvement of health, answer the expectations of the population and provide protection against financial loss due to sickness. In addition to this, the globalization process, the progress of technology, the increase in awareness of healthcare users and a large rise in the costs of health services make policymakers evaluate the efficiency of the health systems which is mostly explained as the capability to transform health inputs in health outputs. In accordance with that, there exists a vast literature on the efficiency of the health systems. Most of these studies have investigated the efficiency of health systems in developed countries; however, there is a little evidence on the efficiency of health systems in MENA countries. Thus, the main purpose of this study is to evaluate the efficiency of health systems in MENA countries via the data envelopment analysis (DEA) methodology.

This study is organized as follows. The section of “Literature review” outlines previous studies about the efficiency of health systems. The section of “Methodology” provides a brief description of the methodology. “The empirical evaluation” section presents the variables, the data and the empirical findings of the analysis. The last section summarizes the main findings and draws some conclusions.

Literature Review

As mentioned above, the efficiency of health systems in developed countries has been examined by a large amount of studies. Retzlaff-Roberts, Chang, and Rubin (2004), Bhat (2005), Afonso and St. Aubyn (2005), Afonso and St. Aubyn (2006), Spinks and Hollingsworth (2009), Kocaman, Mutlu, Bayraktar, and Araz (2012), Wranik (2012), Hadad, Hadad, and Simon-Tuval (2013), Cetin and Bahce (2016) and Boz and Onder (2017) have conducted comparative
analyses on the efficiency of health systems of OECD countries. Borisov, Cicea, and Turlea (2012), Asandului, Roman, and Fatulescu (2014) and Bulgurcu and Ozdemir (2015) have analyzed the efficiency of health systems of selected European countries.

Despite not focusing solely on the efficiency of health systems in MENA countries, it is possible to make inferences from studies that analyze the efficiency of world health systems. Evans, Tandon, Murray, and Lauer (2001) examine the efficiency of world health systems by applying DEA methodology and fixed-effect panel data analysis. Based on data for the period 1993-1997, health expenditure per capita and average years of schooling in the adult population are used as inputs and Disability Adjusted Life Expectancies (DALE) is used as output. According to results, Oman is ranked 1st, Saudi Arabia ranked 10th, United Arab Emirates ranked 16th and Morocco ranked 17th among 191 countries. While Bahrain, Egypt, Algeria, Tunisia, Qatar and Iran are ranked between 30th and 60th, Kuwait, Iraq, Yemen, Syria, Libya, Lebanon and Jordan are ranked between 65th and 100th. Djibouti, which is ranked 163rd place, has the least efficient health system among MENA countries. In another study covering world health systems, Sinimole (2012) uses WHO data for 2008 and applies two DEA models. For both models, health expenditure per capita, number of physicians, nursing and midwifery personnel are labelled as inputs. The first model is based on four outputs: the mortality rates of infant, neonatal, under-five and adult. For the second model, the immunisation coverages of DTP3 and measles are utilized as outputs. The results indicate that the health systems of Kuwait and Morocco are efficient for both models. The results also clarify Syria and United Arab Emirates (UAE) as efficient for the health status model while Bahrain, Iran, Oman and Tunisia are efficient for the health service coverage model.

As far as I know, there is only one study that directly focuses on the efficiency of health systems of MENA countries. Hamidi and Akinci (2016) examine the efficiency of health systems for 20 MENA countries through stochastic frontier analysis (SFA) for the period 1995-2012. They utilize, health expenditure per capita, out-of-pocket health expenditure, number of physicians, the incidence of tuberculosis, secondary school enrollment and improved water source as inputs and life expectancy as output. The results of the study indicate that the health systems of Lebanon, Qatar, and Morocco are the most efficient whereas the health systems of Djibouti, Yemen, and Sudan are the least efficient among MENA region. An overview of the literature is given in Table 1.
<table>
<thead>
<tr>
<th>Study</th>
<th>Countries/Years</th>
<th>Inputs</th>
<th>Outputs</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evans et al. (2001)</td>
<td>191 countries/1993-1997 period</td>
<td>Average years of schooling in the adult population, health expenditure per capita</td>
<td>Disability Adjusted Life Expectancies (DALE)</td>
<td>DEA methodology and fixed-effect panel data analysis</td>
</tr>
<tr>
<td>Retzlaff-Roberts et al. (2004)</td>
<td>27 OECD countries/2000</td>
<td>Number of physicians/hospital beds/MRI, tobacco use, Gini Coefficient, school expectancy, the share of GDP for health care,</td>
<td>Life expectancy at birth, infant mortality rate</td>
<td>DEA (input- and output-oriented BCC)</td>
</tr>
<tr>
<td>Afonso and St. Aubyn (2005)</td>
<td>24 OECD countries/2002</td>
<td>Number of physicians /nurses/hospital beds</td>
<td>Life expectancy at birth, infant survival rate</td>
<td>DEA (input- and output-oriented CCR/BCC), free disposable hull (FDH)</td>
</tr>
<tr>
<td>Afonso and St. Aubyn (2006)</td>
<td>19 OECD countries/2005</td>
<td>Number of physicians / nurses/hospital beds, MRI, tobacco consumption, obesity, educational level, GDP per capita</td>
<td>Life expectancy at birth, infant survival rate, potential years of life not lost</td>
<td>DEA (output-oriented BCC), PCA, Regression analysis</td>
</tr>
<tr>
<td>Spinks and Hollingsworth (2009)</td>
<td>28 OECD countries/1995, 2000</td>
<td>Health expenditure per capita, unemployment rate, GDP per capita, school expectancy years</td>
<td>Life expectancy at birth</td>
<td>Malmquist index, DEA (input-oriented BCC),</td>
</tr>
<tr>
<td>Kocaman et al. (2012)</td>
<td>34 OECD countries/2009</td>
<td>Health expenditure per capita, number of physicians/hospital beds</td>
<td>Life expectancy at birth, under-five mortality rate (inverse)</td>
<td>DEA (input-oriented CCR)</td>
</tr>
<tr>
<td>Sinimole (2012)</td>
<td>180 countries/2008</td>
<td>Health expenditure per capita, number of physicians/nursing and midwifery personnel</td>
<td>The mortality rates of adult/infant/neonatal/under- five (health status model); the immunisation coverage of DTP3/measles (health service coverage model)</td>
<td>DEA (input-oriented CCR/BCC)</td>
</tr>
<tr>
<td>Author</td>
<td>Country/Time Period</td>
<td>Input Variables</td>
<td>Output Variables</td>
<td>Methodology</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>---------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Hadad et al. (2013)</td>
<td>31 OECD countries/2010</td>
<td>Health expenditure per capita, number of physicians/hospital beds density, (Model I); GDP per capita, fruit and vegetable consumption per capita, health expenditure per capita, (Model II)</td>
<td>Infant survival rate, life expectancy at birth,</td>
<td>DEA (output-oriented BCC, super-efficiency, cross-efficiency)</td>
</tr>
<tr>
<td>Asandului et al. (2014)</td>
<td>30 European countries/2010</td>
<td>Public health expenditure (% of GDP), number of physicians/hospital beds</td>
<td>Health adjusted life expectancy (HALE), infant mortality rate, (first model); infant mortality rate, life expectancy at birth (second model)</td>
<td>DEA (input-oriented CCR/ BCC)</td>
</tr>
<tr>
<td>Bulgurcu and Ozdemir (2015)</td>
<td>10 countries joined the EU after 2004/2000-2013 period</td>
<td>Health expenditure per capita, number of physicians/hospital beds, immunization coverage (%)</td>
<td>Infant mortality rate (reverse), life expectancy at birth</td>
<td>DEA (input-oriented CCR)</td>
</tr>
<tr>
<td>Hamidi and Akinci (2016)</td>
<td>20 MENA countries/1995-2012 period</td>
<td>Health expenditure per capita, out-of-pocket health expenditure, number of physicians, improved water source, the incidence of tuberculosis, secondary school enrollment</td>
<td>Life expectancy at birth</td>
<td>SFA</td>
</tr>
<tr>
<td>Cetin and Bahce (2016)</td>
<td>34 OECD countries/2011</td>
<td>Health expenditure per capita, Number of physicians/hospital beds</td>
<td>Life expectancy at birth, infant mortality rate</td>
<td>DEA (input-oriented CCR/ BCC)</td>
</tr>
<tr>
<td>Boz and Onder (2017)</td>
<td>34 OECD countries/2000, 2013</td>
<td>Health expenditure (% of GDP), health expenditure per capita, public health expenditure (% public expenditure), public health expenditure (% health expenditure</td>
<td>Perceived health status, life expectancy at birth, maternal survival rate, infant survival rate</td>
<td>DEA (input-oriented CCR)</td>
</tr>
</tbody>
</table>

**Methodology**

Efficiency is widely described as the maximum output which can be generated by a given amount of input or a given amount of output that can be generated by the minimum input (Farrell, 1957). The efficiency measurement techniques are generally divided into two categories:
non-parametric and parametric methods. A great majority of health efficiency studies have used a non-parametric method which is defined as Data Envelopment Analysis (DEA) (Jacobs, Smith, & Street, 2006). DEA uses inputs and outputs to compute the relative efficiency scores for a number of decision making units (DMUs). The efficiency score ranges from 0 to 1.00 (or 0 to 100%). A DMU with a score of 1.00 (or 100%) is considered to be efficient whereas a DMU with a score less than 1.00 (or 100%) is deemed inefficient relative to other DMUs (Avkiran, 2001, p. 59; Haron & Chellakumar, 2012, p. 238). As far as the efficiency of health systems is concerned, DEA has important advantages such as its ability to deal with multiple inputs and outputs, its computational easiness of use and the simplicity of the assumptions of the method (Carrillo & Jorge, 2017). Though modern efficiency measurement is pioneered by Farrell (1957), theoretical background of the DEA was firstly started by the model of Charnes, Cooper, and Rhodes (1978) which is widely defined as the CCR model.

The CCR model can be estimated by an input-oriented model or an output-oriented model. The first model aims to generate a given amount of output with minimum input while the latter model aims to generate the maximum output with a given amount of input (Turkan, Polat, & Gunay, 2012, p. 4). The choice between these two models upon the direction of the control power. Because the outputs and objectives of the health systems of MENA countries are mostly determined by standards of international health organizations, MENA countries could not change their health policies and outputs substantially. In this regard, they could only increase the efficiency of health systems through minimizing their inputs. Hence, the input-oriented CCR model, which was utilized in Kocaman et al. (2012), Bulgurcu and Ozdemir (2015) and Boz and Onder (2017), is applied in this study. The input-oriented CCR model can be presented as follows:

\[
\begin{align*}
\text{minimize} & \quad \theta_0 \\
\text{subject to:} & \quad \sum_{j=1}^{n} \lambda_j x_{ij} \leq \theta_0 x_{i0}, \quad i = 1, ..., m \\
& \quad \sum_{j=1}^{n} \lambda_j y_{rj} \geq y_{r0}, \quad r = 1, ..., s \\
& \quad \lambda_j \geq 0, \quad j = 1, ..., n
\end{align*}
\]

In Eq. (1), \( \theta_0 \) denotes the efficiency score for DMU \(_0\), \( x_{i0} \) denotes the \( i \)th and \( y_{r0} \) denotes the \( r \)th outputs (Erdumlu & Saricam, 2013, p. 239). For the input-oriented CCR model, an efficient DMU \(_0\) will have \( \theta_0 = 1.00 \) (or 100%) whereas an inefficient DMU \(_0\) will have \( \theta_0 < 1.00 \) (or 100%) (Mukherjee, 2008, p. 80; Sozen & Alp, 2009, p. 5012).

The standard DEA models such as CCR model could categorize DMUs into efficient and inefficient ones and rank them according to their scores. However, it is not possible to rank the efficient DMUs in these models. Andersen and Petersen (1993) firstly addressed this problem by introducing the super-efficiency model which is capable of ranking the efficient DMUs. The
main contribution of this model is to omit the DMU₀, from its own reference set, which permits efficient DMUs to obtain super-efficiency scores that exceed 1. On the other hand, scores for the inefficient DMUs remain the same as in the standard models (Xu & Ouenniche, 2012, p. 580; Sozen & Alp, 2009, pp. 5014-5015). The input-oriented CCR super-efficiency model can be presented as follows:

\[
\begin{align*}
\text{minimize} & \quad \theta_0^g \\
\text{subject to :} & \quad \sum_{j=0}^n \lambda_j x_{ij} \leq \theta_0 x_{i0}, \quad i = 1, \ldots, m \\
& \quad \sum_{j=0}^n \lambda_j y_{rj} \geq y_{r0}, \quad r = 1, \ldots, s \\
& \quad \lambda_j \geq 0, \quad j = 1, \ldots, n
\end{align*}
\]

In Eq. (2), \( \theta_0^g \) denotes the super-efficiency score for DMU₀, \( x_{i0} \) denotes the ith input and \( y_{r0} \) denotes the rth output. For the input-oriented CCR super-efficiency model, an efficient DMU₀ will have \( \theta_0^g \geq 1.00 \) (or 100%) while an inefficient DMU₀ will have \( \theta_0^g < 1.00 \) (or 100%) (Khodabakhshi, Asgharian, & Gregoriou, 2010, p. 2093; Sozen & Alp, 2009, pp. 5014-5015).

**The Empirical Evaluation**

**Data**

According to World Bank, 20 countries are categorised as the MENA countries: Bahrain, Djibouti, Algeria, Jordan, Egypt, Lebanon, Iraq, Qatar, Sudan, Kuwait, Morocco, Iran, Saudi Arabia, Libya, Tunisia, Yemen, Oman, United Arab Emirates (UAE), Syria and Turkey. Since there are missing data for many MENA countries and the purpose of this study is to use the most recent data, this study uses 2014 data extracted from the World Bank and World Health Organization (WHO) databases for 10 MENA countries. Hence, in this study, the DMUs are the 10 MENA countries: Bahrain, Egypt, Iran, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia and Tunisia.

The efficiency of health systems in the 10 MENA countries are analyzed according to two separate DEA models as presented in Hadad et al. (2013). “Model I” is largely based on inputs controlled by the healthcare system whereas “Model II” includes inputs that exceed the healthcare system’s control. Health expenditure per capita is utilized as an input for both models in this study. The health expenditure per capita, physicians per 1000 people and hospital beds per 1000 people are utilized as inputs for Model I. On the other hand, in addition to the health expenditure per capita, school enrollment ratio and GDP per capita are used as inputs for Model II. A higher GDP per capita implies a higher opportunity to access health care for improving population health. Similarly, a higher educational level is closely associated with higher income suggesting better conditions including nutrition, and access to health care (Retzlaff-Roberts et al., 2004, p. 58).
In this study, life expectancy at birth and infant survival rate are chosen as outputs for both models. Life expectancy at birth is generally described as the average number of years that an infant can expect to live if current death rates remain the same. Infant survival rate is a mathematical transformation of the infant mortality rate (IMR) which is widely described as the number of infants dying before 12 months per 1000 live births during the year. DEA methodology indicates that outputs are measured in the principle of “more is better”; however, IMR, which is considered to be a “bad” (undesirable) output for a health system, does not meet this assumption. To solve this problem, the infant survival rate (ISR) is calculated as depicted in Afonso and St. Aubyn (2005) and Afonso and St. Aubyn (2006): \( \text{ISR} = \frac{1000 - \text{IMR}}{\text{IMR}} \).

A large amount of approaches have been developed to determine the minimum number of DMUs required for DEA models. If the number of input is defined as \((n)\) and the number of output is defined as \((m)\), according to Golany and Roll (1989), the minimum number of DMUs should be equal to \(2(n + m)\) and according to Boussofiane, Dyson, and Thanassoulis (1991), it should be equal to \((n \times m)\). In this study, \((n)\) is equal to 3, \((m)\) is equal to 2 and the number of DMUs is equal to 10 for each model. Hence, for both models, the number of DMUs (10) satisfy the criteria addressed in Golany and Roll (1989) and Boussofiane et al. (1991).

Results in this study, the input-oriented CCR model and the input-oriented CCR super-efficiency model are applied to investigate the efficiency of health systems of 10 MENA countries for 2014 data by means of Efficiency Measurement System (EMS) 1.3 software package.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Role</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Minimum Value</th>
<th>Country</th>
<th>Maximum Value</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians (per 1000 people)</td>
<td>Input (Model I)</td>
<td>1.619</td>
<td>0.733</td>
<td>0.618</td>
<td>Morocco</td>
<td>2.608</td>
<td>Kuwait</td>
</tr>
<tr>
<td>Hospital beds (per 1000 people)</td>
<td>Input (Model I)</td>
<td>1.869</td>
<td>0.585</td>
<td>1.100</td>
<td>Morocco</td>
<td>2.850</td>
<td>Lebanon</td>
</tr>
<tr>
<td>Health expenditure per capita, PPP (current international $)</td>
<td>Input (both models)</td>
<td>1586.197</td>
<td>939.554</td>
<td>428.273</td>
<td>Morocco</td>
<td>3084.746</td>
<td>Qatar</td>
</tr>
<tr>
<td>GDP per capita, PPP (current international $)</td>
<td>Input (Model II)</td>
<td>40487.386</td>
<td>37887.0338</td>
<td>7457.181</td>
<td>Morocco</td>
<td>127318.901</td>
<td>Qatar</td>
</tr>
<tr>
<td>School enrollment ratio (primary, % gross)</td>
<td>Input (Model II)</td>
<td>105.817</td>
<td>7.396</td>
<td>94.314</td>
<td>Lebanon</td>
<td>118.198</td>
<td>Saudi Arabia</td>
</tr>
<tr>
<td>Life expectancy at birth (years)</td>
<td>Output (both models)</td>
<td>75.624</td>
<td>2.207</td>
<td>71.120</td>
<td>Egypt</td>
<td>79.231</td>
<td>Lebanon</td>
</tr>
<tr>
<td>Infant survival rate</td>
<td>Output (both models)</td>
<td>96.630</td>
<td>38.663</td>
<td>39.000</td>
<td>Morocco</td>
<td>148.254</td>
<td>Bahrain</td>
</tr>
</tbody>
</table>

Source: World Bank and WHO databases
The mean, the standard deviation, the minimum and maximum values for inputs and outputs of this study are presented in Table 2. As indicated by the standard deviations, great differences occur among 10 MENA countries regarding two inputs (GDP per capita and health expenditure per capita) and one input (infant survival rate).

Table 3: The results for the input-oriented CCR model and the input-oriented CCR super-efficiency model

<table>
<thead>
<tr>
<th>Country</th>
<th>Model I Efficiency score (%)</th>
<th>Model I Super-efficiency score (%)</th>
<th>Reference set</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Average = 91.56%)</td>
<td>(Average = 117.71%)</td>
<td></td>
</tr>
<tr>
<td>Bahrain</td>
<td>100.00%</td>
<td>231.17%</td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>97.48%</td>
<td>97.48%</td>
<td>Lebanon (0.11) Morocco (0.83)</td>
</tr>
<tr>
<td>Iran</td>
<td>84.94%</td>
<td>84.94%</td>
<td>Morocco (0.55) Oman (0.36) Qatar (0.09)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>83.74%</td>
<td>83.74%</td>
<td>Bahrain (0.50) Oman (0.33) Qatar (0.13)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>100.00%</td>
<td>121.93%</td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>100.00%</td>
<td>148.08%</td>
<td></td>
</tr>
<tr>
<td>Oman</td>
<td>100.00%</td>
<td>102.36%</td>
<td></td>
</tr>
<tr>
<td>Qatar</td>
<td>100.00%</td>
<td>157.85%</td>
<td></td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>49.45%</td>
<td>49.45%</td>
<td>Morocco (0.35) Oman (0.47) Qatar (0.15)</td>
</tr>
<tr>
<td>Tunisia</td>
<td>100.00%</td>
<td>100.13%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Model II Efficiency score (%)</th>
<th>Model II Super-efficiency score (%)</th>
<th>Reference set</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Average = 91.57%)</td>
<td>(Average = 104.23%)</td>
<td></td>
</tr>
<tr>
<td>Bahrain</td>
<td>100.00%</td>
<td>104.57%</td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>99.83%</td>
<td>99.83%</td>
<td>Lebanon (0.12) Morocco (0.81)</td>
</tr>
<tr>
<td>Iran</td>
<td>84.14%</td>
<td>84.14%</td>
<td>Lebanon (0.87) Morocco (0.09)</td>
</tr>
<tr>
<td>Kuwait</td>
<td>86.24%</td>
<td>86.24%</td>
<td>Bahrain (0.06) Lebanon (0.88)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>100.00%</td>
<td>174.28%</td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>100.00%</td>
<td>147.79%</td>
<td></td>
</tr>
<tr>
<td>Oman</td>
<td>82.56%</td>
<td>82.56%</td>
<td>Lebanon (0.97)</td>
</tr>
<tr>
<td>Qatar</td>
<td>94.37%</td>
<td>94.37%</td>
<td>Bahrain (0.12) Lebanon (0.86)</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>74.76%</td>
<td>74.76%</td>
<td>Lebanon (0.94)</td>
</tr>
<tr>
<td>Tunisia</td>
<td>93.79%</td>
<td>93.79%</td>
<td>Lebanon (0.43) Morocco (0.55)</td>
</tr>
</tbody>
</table>

Source: Author’s own calculations
The results obtained by the input-oriented CCR model and the input-oriented CCR super-efficiency model according to the two models are presented in Table 3. According to the input-oriented CCR model for Model I, the average efficiency score is 91.56% whereas the minimum score is 49.45% for Saudi Arabia. The health systems of Bahrain, Lebanon, Morocco, Oman, Qatar and Tunisia are found to be efficient. These efficient health systems create reference sets which provide the required corrections to make the inefficient health systems into efficient health systems. Regarding Model I, the reference health systems and their referencing frequencies are described as follows: Morocco (3 times), Oman (3 times), Qatar (3 times), Bahrain (1 time) and Lebanon (1 time). According to the input-oriented CCR super-efficiency model, the average super-efficiency score is 117.71% and the rankings of the efficient health systems are as follows: Bahrain, Qatar, Morocco, Lebanon, Oman and Tunisia. The reference health systems and their referencing frequencies for the input-oriented CCR model are same for the input-oriented CCR super-efficiency model.

Regarding the input-oriented CCR model for Model II, the average score is 91.57% whereas the minimum score is 74.76% for Saudi Arabia. The health systems of Bahrain, Lebanon and Morocco are found to be efficient. According to the input-oriented CCR super-efficiency model, the average super-efficiency score is 104.23% and the rankings of the efficient health systems are as follows: Lebanon, Morocco and Bahrain. Regarding the second model, the reference health systems and their referencing frequencies which are same for both the input-oriented CCR model and the input-oriented CCR super-efficiency model, are described as follows: Lebanon (7 times), Morocco (3 times) and Bahrain (2 times).

For both Model I and Model II, the health systems of Bahrain, Lebanon and Morocco are found to be efficient whereas the health system of Saudi Arabia is found to be least efficient. The results of this study are partially consistent with previous studies such as Evans et al. (2001), Sinimole (2012) and Hamidi and Akinci (2016).

**Conclusion**

In this study, the efficiency of health systems in 10 MENA countries is investigated by the input-oriented CCR and the input-oriented CCR super-efficiency model. Based on 2014 data, two separate models, which differ in the level of control of the health system on the inputs, are applied.

The results of the input-oriented CCR model for Model I indicates Bahrain, Lebanon, Morocco, Oman, Qatar and Tunisia as efficient. According to the results of the input-oriented CCR super-efficiency model for Model I, the rankings of the efficient health systems are as follows: Bahrain, Qatar, Morocco, Lebanon, Oman and Tunisia. On the other hand, the health systems of Bahrain, Lebanon and Morocco are defined as efficient regarding the results of the
input-oriented CCR model for Model II. The rankings of the efficient health systems created by the input-oriented CCR super-efficiency model are as follows: Lebanon, Morocco and Bahrain. For both Model I and Model II, the health systems of Bahrain, Lebanon and Morocco are found to be efficient.

The 6 MENA countries have efficient health systems regarding Model I, however; only 3 MENA countries have efficient health systems according to the second model. This situation emphasizes the importance of widening policies to areas that exceed the health system’s control (income and education level) rather than concentrating only on guaranteeing sufficient medical care.
References


Introduction

Being healthy is extremely important for human nature. Throughout history one of the basic phenomena that mankind need is being able to live without suffering, without sickness. Although the concept of health has been defined many times, there is still not fully convincing and inclusive definition. Being healthy of persons is directly related to the development and progress of countries. As known, healthy generations have the possibility of holding the dynamics in the hands of the country and moving them forward.

Becoming the health sector, put itself on the market mechanism among the capitalism wheels, it isn't based on time immemorial. After the Industrial Revolution, it was understood that human health is very valuable to capitalism and in this direction, governments have built policies. As known, health has been transformed into a sector with developing new teachings and left invisible hand. However, since it was understood that the health service could not be fully included in the private goods status, it was publicly offered as semi-public goods and services. Profit-giving services are mostly left in the private sector, and protective and basic health services are given for the protection of the public.

As known, the worldwide topic is a health spending to increase. While spending increases both in public and private sectors, in terms of revenues, the situation is underperformed of expected value. However, many legal and regulatory reforms in our health sector has improved the interest of the public; the private sector has also been able to attack at the point of service encounter. Apart from reforms and legal arrangements, it has been argued that the state has presented in the education and health issues which are in the status of semi-public goods and services, under favor of tax concessions and subsidies, there is a leap in the sectors in question.

The private community, which has risen in the health sector, has not only used the privileges it has, but also started to show a tendency to subcontract. This tendency, which has begun to

* Nigde Omer Halisdemir University, Faculty of Economics and Administrative Sciences, Department of Public Finance, +90 (388) 2252028 / aligokhangolcek@gmail.com
be seen in the private health sector, has begun to pose a problem not only in the presentation of health services but also inequality of income and justice.

In this study, the contribution of the health sector on economy between 2000-2017, has been examined and explained with tables and graphs for both private and public sector. This study focuses on the economic privileges of the private health sector and its contribution on economy.

Right to Health and Health Transformation

In Turkish law, the right to health was not found a place at the constitutional level, until the 1961 Constitution. Article 49 of the 1961 Constitution stipulates that "The State shall be obliged to…. ensure that everyone can live in body and soul health " and that there should be a positive obligation to the state in the right to health.

In the 1982 Constitution, as in the Universal Declaration of Human Rights, the " right to life " concept was regulated. Accordingly, Article 17 of the Constitution states: " Everyone has the right to life and the right to protect and improve his/her corporeal and spiritual existence. The corporeal integrity of the individual shall not be violated except under medical necessity and in cases prescribed by law; and shall not be subjected to scientific or medical experiments without his/her consent. No one shall be subjected to torture or mal-treatment; no one shall be subjected to penalties or treatment incompatible with human dignity". With the said substance, the rights to live of all citizens under protection, the state security within positive obligation.

However, it has also been regulated in the Constitution, especially about health issues. At this point, Article 56 of the Constitution contains the heading "Health Services and Protection of the Environment" and "Everyone has the right to live in a healthy and balanced environment. It is the duty of the State and citizens to improve the natural environment, to protect the environmental health and to prevent environmental pollution. The State shall regulate central planning and functioning of the health services to ensure that everyone leads a healthy life physically and mentally, and provide cooperation by saving and increasing productivity in human and material resources. The State shall fulfill this task by utilizing and supervising the health and social assistance institutions, in both the public and private sectors. In order to establish widespread health services, general health insurance may be introduced by law. " The article not only mentioned about life but also about right to a healthy life. Because the state will maintain its own permanence by offering health services that show semi-public property properties to its citizens. From a constitutional perspective, it appears that economic and social rights are at the core of the right to benefit from health services.

Health services, which constitute one of the basic elements of the idea of creating a healthy society, which is an indispensable rule for sustainable development and human capital, is extremely important for the current state of the economy. As it is known, health services are spreading intense external benefits as a sign of semi-public property.
However, it is a reflection of the social state view that the health services considered as basic services should be seen as full public goods and only offered by the state. But the rising population, the developing technology, the increase in demand for health services due to the thought of individuals to live well, caused the expenditures made in this area to increase. The fact that this increase has reached a serious level has created a burden on public spending. Along with this situation, it has led to sterility and inefficiency in the mentioned areas. Governments have begun to offer health services in the form of public services with the private sector in order to eliminate these negative situations, to eliminate funding difficulties and to transform health services into quality and productive structure.

The situation has not developed very differently in our country. Prior to 1980, health services were being offered more as a public service, as in many countries. Social Insurance Institution (SII)’s premium incomes, and funds from the transfer of the Treasury and state hospitals, SII hospitals and a few university hospitals were providing health services. Private hospital operations were only available in metropolitan cities such as Istanbul and Ankara and offered limited services. However, there are a firm hand on the pharmaceutical industry, and SII has been drawing attention as the most important actor of this service network (Sönmez, 2009, pp. 32-33).

After 1990, in the framework of the policies proposed by the World Bank and the IMF, known as the Bretton Woods twins, it has drawn attention as a widespread practice, including privatization, commercialization and market inclusion of health services in central countries. (Turanci & Bulut, 2016, p. 41). The contribution of health expenditures on economic growth both in short and long-term is considerably high. In the framework of human capital theory, particularly the presence of healthy workforce affects productivity in directly (Alper & Demiral, 2016, p. 44). In light of this information, the health sector, which is a key component of economic growth and is a policy tool within the endogenous growth model (Karayılmazlar & Göde, 2017, p. 133), as is known, has commodified with the outsourcing process and the influence of neoliberal policies, in other words, it has become bought and sold.

Especially applied in the 1990s to some health policies is desirable nature of the reform, in the context of Turkey. It is possible to summarize the main points of the reforms carried out in the 1990s (Akdağ, 2011, p. 24):

- The social security institutions (SII, BAĞ-KUR and Retirement Fund) are gathered under the roof of a single institution and the General Health Insurance (GHI) is put into practice,
- Providing family physician services as primary care health service,
- Saving autonomous structure to hospitals,
- Cloak controls in a guise of a healthier and more efficient structure.

At the material time, despite the fact that important regulations have been made for the health sector, the application area has not been found, that’s the reason why not operationalized. Finally,
against to current problems, Turkey has been targeted delivery of health care to everyone on equal terms with the Emergency Action Plan, announced in 2002. Justice and Development Party government launched the project known as the Health Transformation Program in 2003 to implement the vision set out in the Urgent Action Plan (Çavmak & Çavmak, 2017, p.51), and Turkey has revolutionized in the health care system with this program.

The fragmented structure in the health sector, the different service providers and funding sources, the health indicators behind the OECD countries and lack of social safety net constitute the basic justifications for the Health Transformation Program (Yereli, Köktaş & Selçuk, 2014, p. 275). Regulations under the Health Transformation Program are shown in Table 1.

<table>
<thead>
<tr>
<th>Year</th>
<th>Reform</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>Health Transformation Program</td>
<td>The organization, presentation, and financing of health services</td>
</tr>
<tr>
<td>2006</td>
<td>Social Security Institution</td>
<td>SII, BAĞ-KUR and Retirement Fund under one roof (Law no. 5502)</td>
</tr>
<tr>
<td>2006</td>
<td>General Health Insurance</td>
<td>Guaranteeing persons with social insurance and general health insurance (Law no. 5510)</td>
</tr>
<tr>
<td>2007</td>
<td>Health Practice Manifest</td>
<td>In the framework of the laws 5502 and 5510, GHI which is covered by Social Security Institution and within the scope and the basis and procedures for benefiting from the costs of health services, roads, daily and attendant expenses financed by the institution, and the prices payable for these services.</td>
</tr>
<tr>
<td>2011</td>
<td>Family Physician Services</td>
<td>Starting in the pilot area in 2002 and starting Turkey in general in 2011, aimed at the development of family physician services as primary care health service.</td>
</tr>
</tbody>
</table>

Source: Ministry of Health, the Health Transformation Program in Turkey, the 2012 Assessment Report, was compiled by us.

As shown in Table 1, after the publication of the HTP in 2003, the fragmented health system has been institutionally combined under the name of SSI. Insured persons are included under one roof which is also possible with the GHI. The financing phase of this new organization of health services has also been resolved with Health Practice Manifest (HPM). It is also aimed to improve the service delivery with the application of family physician services.

This transformation in the Turkish health system has led the Ministry of Health to become a more regulatory and supervisory structure, which is centralized in the presentation of health services. However, some studies have shown that health reforms have a negative impact, especially in terms of catastrophic health expenditures. Catastrophic health expenditures, for
example, rose from %9.8 in 2003 to %10.3 in 2011 (Selçuk & Köktaş, 2014). On the other hand, with the reform in health sector, the structure of university hospital, which had previously high rates of debt increase and prices, has changed and fiscal and financial structure has become more active with the regulations made (Gülşen & Yıldıran, 2017). In summary, some radical changes have been made with SDP and generally positive results have been obtained.

The health sector is one of the areas where the state intensively intervenes. Political decision-makers play an important role in the rehabilitation of human, financial and other resources through the Ministry of Health and other indirectly related ministries and health organizations. So, it provides a guarantee in terms of responding to the needs of the public and health services undertaken by public actors, ensuring fairness in the financing of health services, reducing inequality in reaching health services and improving all health-related indicators (WHO, 2006, p. 1).

However, in the globalizing world, borders have become increasingly close together, and service offerings become global. The presentation of semi-public goods and services, especially those with a high level of positive externalities such as education and health, has started to be carried out effectively both by the public and private sectors all over the world. In this context, the presentation of health services is done by who carries out and what’s being in the scope of, which is important because of the essence of working.

**Presentation and Scope of Health Services in Turkey**

How can be publicised and financed of health care, depends on where health care is to be found as a type of goods or service. The pricing of health services on the market will lead to the financing of the service by the private sector, while the weight of public service will lead to public financing. In countries where the financing of health services is provided by the state or financed by social insurance, health care is aimed at equal access to important services, but the real situation is different.

The way in which countries offer health services differs according to the dominant mode of governance, but also with the ideology of the power present in the country. The presentation of health services can be classified according to four different views. These include i) private enterprise (the free market), ii) welfare orientation, iii) holistic (inclusivist) services, iv) socialist (central planning) (Sargutan, 2005, p. 427). The introduction of health services as a private enterprise is seen in some developing and underdeveloped countries (as Kazakhstan, the Philippines), especially in the USA. Individuals in these countries are paying the cost of health care and directly benefit from the service. The welfare-oriented presentation, which is the second group classification, is a system which is predominantly functioning in compulsory illness and health insurance which is also seen in our country. In the case of inclusive or holistic service provision, it is compulsory for full-scale health services and safety. The system is seen in
countries like Spain, Denmark, Slovenia. If the delivery of health services is socialist (central planning), then there is the question of nonmarket-totally collective service. Although it is seen in the countries of the former Soviet Union, today there is no country fully implemented.

The provision of health services by the public sector, and the market is shaped more by the structural characteristics of the goods or services. The peculiar characteristic of the health service is that it specifies who should provide the supply of this service and gives a clue as to how the financing will be realized. The reasons why the final product produced by health service providers are not fully defined and therefore differ from other goods and services are listed as follows: i) Although many individuals are sick, they do not want to be treated or not aware of their illness, ii) The urgent need for treatment does not reveal the patient’s own choice, iii) The patient cannot determine the cost of the treatment, iv) The patient does not know the quality of the treatment he received, v) does not have the proper insurance services, vi) Blocking the optimal price of insurance moral hazard inherent in the insurance system, vii) provided against infectious diseases the immunity is also beneficial outside the hospital itself, viii) the absence of capacity at the competence level, ix) The patient is rational and does not receive competent health services in line with the ideas of other individuals in the society. This may be due to lack of income, as well as individual preferences and circumstances, such as time myopia and the social environment (Cuyler, 1971, pp. 189-202). Therefore, asymmetric information, which is considered one of the market failures, is a frequently encountered problem in the health sector.

However, the demand for healthcare services shows certain differences in the demand for other goods and services. First of all, health service is a derived demand. Citizens in the health claim demand health service. Secondly, the physician, who is the service provider, has a direct influence on the demand (Orhaner, 2006, p. 6). In other words, the physician acting on behalf of the patient is in both supply and demand determining position. It is considered as a third factor that your demand will change according to the type of financing of the service. Accordingly, the payment of wages by insurance also affects the demand. Another distinguishing feature of the health services claim is that the goods show both investment and consumption properties. (Batırel, 1991, pp. 18-19).

The health sector is one of the fastest growing sectors in our country. Production stage in many public and private organizations and in the funding, process is moving along in the health sector in Turkey. Turkey takes place in the public and private sectors of service providers in the health sector where weight is at the public providers. These are consisting of three groups; Ministry of Health, Social Insurance Institution (SSI) and university hospitals.

Every ministry affiliated to the public sector can make health expenditures and especially institutions such as Ministry of Health, Social Security Institution, University Hospitals, Ministry

---

1 Derived demand is a consequentialness, which participated in the production of factors of production factors demand labor, capital, and material that is used in the production of land.
of National Education, municipalities are leading the way in making health expenditures. A change in 2016, military hospitals affiliated to the Ministry of National Defense and Gulhane Military Medical Academy (GMMA), which had previously provided health services, were transferred to the Ministry of Health. On the other hand, private hospitals, examination rooms, polyclinics which are structured in the private sector are also actively involved in the presentation of health services.

A skeletal system that sustains the health care institutions of the Ministry of Health in Turkey. The Ministry of Health is authorized and responsible for the health of the country and has been divided into many lower and upper units as a central and provincial organization.

Table 2: Institutions and Organizations in the Health Sector, by Functions, Turkey.

<table>
<thead>
<tr>
<th>Policy Formulation</th>
<th>Health Services Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public</td>
</tr>
<tr>
<td>-Grand National Assembly of</td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
</tr>
<tr>
<td>-Ministry of Health</td>
<td></td>
</tr>
<tr>
<td>-Constitutional Court</td>
<td></td>
</tr>
<tr>
<td>-Higher Education Institution</td>
<td></td>
</tr>
<tr>
<td>Administrative Decision Making</td>
<td></td>
</tr>
<tr>
<td>-Ministry of Health</td>
<td></td>
</tr>
<tr>
<td>-Provincial Health Directorates</td>
<td></td>
</tr>
<tr>
<td>Health Services Financing</td>
<td></td>
</tr>
<tr>
<td>-The Ministry of Finance</td>
<td></td>
</tr>
<tr>
<td>-Social Security Institution</td>
<td></td>
</tr>
<tr>
<td>-Private Insurance Companies</td>
<td></td>
</tr>
<tr>
<td>-International Agencies</td>
<td></td>
</tr>
<tr>
<td>-Ministry of Health</td>
<td></td>
</tr>
<tr>
<td>-University Hospitals</td>
<td></td>
</tr>
<tr>
<td>-Ministry of Defense*</td>
<td></td>
</tr>
<tr>
<td>-Private Hospitals</td>
<td></td>
</tr>
<tr>
<td>-Foundation Hospitals</td>
<td></td>
</tr>
<tr>
<td>-Minority Hospitals</td>
<td></td>
</tr>
<tr>
<td>-Specialist Practitioner / Experts</td>
<td></td>
</tr>
<tr>
<td>-Physicians</td>
<td></td>
</tr>
<tr>
<td>-Outpatient Clinics</td>
<td></td>
</tr>
<tr>
<td>-Laboratories and Diagnosis Centers</td>
<td></td>
</tr>
<tr>
<td>-Pharmacies</td>
<td></td>
</tr>
<tr>
<td>-Medical Device and Material Sellers</td>
<td></td>
</tr>
</tbody>
</table>

* According to Article 106 of Law No. 6756, "Gulhane Military Medical Academy and Military Hospitals" were transferred to the Ministry of Health.


The Ministry of Health, together with being the only institution providing preventive health services, is the most important institution that performs primary health care services. These services are carried out through health centers and sanitariums, within the scope of the right of health, organized in the 1961 Constitution. The primary tasks of health centers prevent and

---

2 According to Article 106 of the Law No. 6756 “Acceptance of some measures to be taken in the context of emergency law and subscription of National Defense University and amendments to certain laws by Decree-Law. “All the rights and obligations of health institutions belonging to Gulhane Military Medical Academy and the medical institutions of the Turkish Armed Forces Rehabilitation and Care Center and military hospitals, dispensary and similar health service units and the General Command of Gendarmerie are all rights and obligations, receivables and debts, contracts and commitments, Together, they will be transferred to the Ministry of Health and the allocated immovables belonging to them will be allocated to the Ministry “.
treat the spread of infectious diseases, to provide maternal and child health services, to take part in family planning, to provide public health education, to provide patient care and environmental health.

In the context of the Health Transformation Program (HTP), a new practice called family practice has also come into force. Family Practice; from the unborn child to the oldest member of the family, can be defined as the physician of all the members of the family. With HTP, individual preventive health services, outpatient services, and home care services are included in family medicine. In cases exceeding the scope of primary health care services, the family physician directs them to the relevant places by guiding the patient, like a health consultant.

Delivery of health services in Turkey are carried out by a three-digit form. These are primary service providers, secondary service providers, and tertiary service providers. The primary service providers were HTP; health center, official institutional arrangements, maternal-child health and family planning centers, tuberculosis dispensaries and health centers; The HTP has been reorganized to be the three primary institutions that provide primary health care. These were identified as Family Health Center (FHC), Community Health Center (CHC) and 112 Emergency Health Services.

![Figure 1: Change in Primary Health Care Providers in Turkey](image)

*Source: Primary Health Care Data Guide.*

Second-tier service providers; state hospitals that are not training and research hospitals, private branch hospitals, private medical centers and private branch offices. Third level service providers are; training and research hospitals, private branch education and research hospitals and university hospitals.

**The share of Dimension of Health Sector and Private Health Sector Interest in Economy**

Before the HTP, financing of health care in Turkey was covered by different sectors, central government, local authorities, social security institutions, private social security institutions, such as private insurance companies and direct payments of the company.
While the health expenditures of the public sector in 1999 were 2.91% of GDP, the private sector share was 1.85%; and 4.76% in total. In 2002, the share of health expenditures in GDP increased from 5.3% to 6.0% in 2007, to 5.4% in 2013 and 4.6% in 2016.

**Chart 1: Health Expenditures by Years and Share in GDP, 2002-2016**

The share of health expenditures within the Gross Domestic Product despite the improvements in health care services in 2002-2016 did not show much change.

During 1980, private health services showed an increase in the incentive policies of the private sector. In this context, the exchange of hospital numbers over the years also provides information about private sector development.

**Chart 2: Number of Hospitals by Years, 2002-2016**

The share of health expenditures within the Gross Domestic Product despite the improvements in health care services in 2002-2016 did not show much change.
As it is seen in Chart 2, while the Ministry of Health hospitals are mainly in the health service provision, the number of private hospitals seems to increase. While the number of hospitals affiliated to the Ministry of Health in 2002 was 774, this figure was 876 with the addition of 102 hospitals in 2016. When we look at the numbers of university hospitals that provide better quality health care in our country, it was 65 in 2012, with an increase of 30% in 2002. Between the years of 2012-2016, not a lot of changes in university hospitals and university hospitals as of 2016. In Turkey, there are 69 units.

**Chart 3: Hospital Bed Capacities, 2002-2016.**

![Chart 3: Hospital Bed Capacities, 2002-2016.](image)

*Source: Health Statistics Yearly, 2016.*

When the bed capacity of the Ministry of Health hospitals is examined, the number of beds increased from 107,394 in 2002 to 122,222 in 2012 with the addition of 14,928 new beds. By 2016, the number of these beds has been determined to be 132,921. Nevertheless, there has not been a very significant increase in bed capacities of university hospitals over the years. However, the serious increase in the presence of private hospitals directly affected the bed capacities and the number of private hospital beds, which was determined as 12,387 in 2002, was 47,143 in 2016. In addition, there is not much change in the bed capacities belonging to other hospitals. With the amendment of the law made in 2016, military hospitals are transferred to the Ministry of Health; The number of beds in hospitals affiliated to the Ministry of Health has seen a significant increase compared to the previous year.

With the private sector starting to be involved in the health field; there has been a perception that quality presentation and service, previously attributed to university hospitals, has been reshaped around competition and market conditions, and that it is increasingly in private hospitals. When the number of qualified beds, number of intensive care beds, number of hemodialysis devices and number of medical imaging devices are taken into account, it is seen that the private healthcare sector has passed for a public, about delivery service.
The use of more technology by the private sector in the health sector compared to the public has increased productivity and demand for the private health sector has increased, as a natural consequence. However, the fact that prices are left in market conditions means a burden.
for patients who are treated in private hospitals. With private hospitals becoming a side of income for physicians, only the number of physicians working in the private sector is only 20% of the total number of physicians.

By contrast with Chart 4, the number of private sector employees in the health sector has increased over the years. Especially the presence of subcontracting companies is suppressing the wages of health workers, and many health workers can find jobs in private companies. As part of globalization and neoliberal transformation, the understanding of the state’s downsizing of the economy has unfortunately also manifested itself in the field of health.

During the period of neoliberal health politics (which can be said to cover the post-HTP period), the number of people working in the public sector doubled, the number has increased to 6 times in private sector (Etiler, 2015, p. 5). However, it became possible for subcontracting employees to be included in the public sector (transition) with the legislation made in 2017. The benefit-cost analysis for the healthcare workers who will have the possibility of working more efficiently under job security can be done after the transfer process.

The situation of Private Hospitals over the Social Security Institution

Companies operating in the private health sector are granted both economic and legal privileges. As it is known the state alone cannot make sufficient presentation, and a victim is born in the areas of semi-public goods/services. In order to be able to avoid this, it is necessary to invest in the private sector. However, this situation is largely based on voluntary profit maximization under capitalist conditions.

The economic data related to the private hospitals to be used in this part of the study were formed taking into account the data and statistics of the social security institution. However,
the tax status of private healthcare enterprises and the economic and legal facilities they have will also be discussed in the next part of the study.

As is known, SSI is known as "black hole" in public expenditures. Particularly, the loss of damages caused by State Economic Enterprise (SEE)'s is seen as an important factor in taking this analogy. Nevertheless, the Social Security Board is the most important public institution in terms of health expenditure except the Ministry of Health. The Republic of Turkey is a social state of law, healthcare-related expenditures made with government support can be seen as a reflection of some of the social state. In this context, the health expenditures made by SSI are generally grouped under three headings as treatment, medicine, and other cattle. In the light of this data showing the shares of state hospitals, university hospitals and private hospitals, in particular, the shares of private sector SSI are shown in Table 7 as of 2002-2009.

<table>
<thead>
<tr>
<th>Years</th>
<th>Ministry of Health</th>
<th>University</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>1.815</td>
<td>620</td>
<td>396</td>
</tr>
<tr>
<td>2003</td>
<td>2.998</td>
<td>827</td>
<td>538</td>
</tr>
<tr>
<td>2004</td>
<td>4.083</td>
<td>1.079</td>
<td>743</td>
</tr>
<tr>
<td>2005</td>
<td>3.521</td>
<td>1.083</td>
<td>1.021</td>
</tr>
<tr>
<td>2006</td>
<td>5.442</td>
<td>1.325</td>
<td>1.723</td>
</tr>
<tr>
<td>2007</td>
<td>6.399</td>
<td>1.523</td>
<td>2.345</td>
</tr>
<tr>
<td>2008</td>
<td>7.325</td>
<td>2.247</td>
<td>4.381</td>
</tr>
<tr>
<td>2009</td>
<td>7.875</td>
<td>2.572</td>
<td>4.682</td>
</tr>
</tbody>
</table>

Source: SSI Financial Statistics.

After 2009, separate items were not shown for the sectors, and a different account was started to be arranged. For this reason, it is not possible to determine in what sector the total health expenditures made by SSI after 2009 are presented to the public.

Nevertheless, the private sector, which was particularly "timid" compared to the effects of the 2001 crisis, recovered as of 2005 and left university hospitals as the expenditure pen as competence. Another break, as seen in Chart 5, has been seen in 2007-2008, when the 2008 Financial Crisis began. As a result, it is not surprising that there is a recession when it is considered that the borrowing costs of an entirely private sector are increased. It is not wrong to say that in the foresight and estimates, the contribution of SSI to private sector health expenditures will increase over the years. This is because there is a tremendous increase in the number of private hospitals opened as already examined (Chart 2).
Finally, it is aimed to see the economic size of the private health sector by examining the number of applications to hospitals and their invoice amounts excluding VAT. In this context, a total of 2,810,098,000 applications were made in 2010-2016, including state hospitals, universities and private patients.

<table>
<thead>
<tr>
<th>Years</th>
<th>Public Secondary Health Care Services</th>
<th>Public Tertiary Care Services</th>
<th>Private Secondary Health Care Services</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>139.293</td>
<td>44.075</td>
<td>71.470</td>
<td>21.775</td>
</tr>
<tr>
<td>2011</td>
<td>156.117</td>
<td>50.142</td>
<td>85.924</td>
<td>25.179</td>
</tr>
<tr>
<td>2012</td>
<td>203.135</td>
<td>65.124</td>
<td>87.932</td>
<td>30.592</td>
</tr>
<tr>
<td>2013</td>
<td>222.136</td>
<td>73.167</td>
<td>91.386</td>
<td>34.699</td>
</tr>
<tr>
<td>2014</td>
<td>242.331</td>
<td>77.548</td>
<td>88.687</td>
<td>38.454</td>
</tr>
<tr>
<td>2015</td>
<td>251.887</td>
<td>85.539</td>
<td>90.428</td>
<td>40.589</td>
</tr>
<tr>
<td>2016</td>
<td>270.402</td>
<td>96.640</td>
<td>83.995</td>
<td>41.451</td>
</tr>
</tbody>
</table>

**Source:** It was created by me using SSI Financial and Health Statistics.

When the number of applications is examined, it is seen that state hospitals are demanded intensively. The reason for this is that the service offered is cheaper and the convenience of accessing physicians. However, it is seen that the demand is mostly in secondary health care services. At this point, it is fixed that the private sector has passed the university hospitals and the second largest language in the past has the number of applications. However, when the billing amounts are examined (the accrued figures are shown), it is seen that the private sector health facilities have improved after 2012 and more invoices have been received.
Taxation of Private Health Sector

Private hospitals operate as taxpayers in the context of income as well as corporations’ taxpayers. Also, they are VAT taxpayers due to their service performance. Also, they are VAT taxpayers due to their offered services.

According to Article 37 of the Income Tax Law (IT), hospital operation is a commercial activity. Therefore, the profits obtained from this activity are also considered as commercial earnings. However, as it is known, private hospitals established as private companies, ordinary partnerships, and private enterprises, the profits of the partners are subject to income tax; the profit of private hospitals established as economic enterprises belonging to capital companies or associations-foundations is subject to the corporation tax.

According to Article 4 of the Corporate Tax Law, institutions belonging to public administrations and institutions, they are exempt from taxation of hospitals. Likewise, university hospitals are also exempt from corporate tax. However, the profits earned in hospitals belonging to the public benefit associations are subject to the corporation tax.

On the other hand, Article 17/2 of the Value Added Tax Law;

"General and annexed budget apartments, special provincial administrations, municipalitites, peasants, associations formed by them, universities, revolving funds, public institutions and institutions established by law, professional institutions in the nature of public institutions, political parties and trade unions, retired lawyers and charities, beneficial associations for public interest, cooperatives for agricultural purposes and subsidiary foundations that are granted tax exemption by the Council of Ministers operate hospitals, be exempt from granted tax."

However, VAT responsibility continues for the delivery and services of the hospitals other than those listed above. However, the VAT rate for health services is regulated according to certain conditions. If all of the conditions are met, an 8% VAT rate will apply. According to the special notice B.07.0.GEL.0.54 / 5428-1880 dated 05/01/2005, "Natural or legal person entity that is authorized by the relevant Ministries or laws, which is human and animal health care, diagnosis, treatment and rehabilitation services (including animal breeding services), ambulance services" VAT rate was determined as 8%.

- If the service being made is subject to permission,
- If the permit is based on ministries or laws,
- The service provider must have this
- The service should be from preventive medicine, diagnosis, treatment, rehabilitation and ambulance services. In the case of the rental of ambulances, VAT is determined as 18%.
Another issue that is seen in private hospitals, in terms of taxation occurs in the remuneration of physicians working in private hospitals. Because private hospitals pay to doctors can be made in two ways. These are wage and self-employment payments. In this context, according to ITL Article 61, "wages which are provided by means of money and remunerations given to employees who are subject to the employer and to a certain workplace and which can be represented by money" are defined as wages. On the other hand, ITL Article 65 self-employment earnings are as follows "to carry out on their own behalf and account under personal responsibility the work which is not subject to business and which is not based on professional knowledge or expertise.' However, according to ITL 65/3, The generated profits arising on the basis of professional services carried out by collective, limited partnership and ordinary partnership are also regulated as self-employment income.

In the light of this information, if doctors work in hospitals at a fee, some conditions need to be met. For example, between hospital and doctor; doctor room or partition to be allocated, the doctor is unable to accept patients without approval on its behalf, cannot run unauthorized another institution, provisions such as paid according to hours worked in the service fee that includes is required of the contract. These contracts must be recorded by the hospital administration to the MEDULA system, and the work permit for the physician to be employed must have been issued. After all this, two types of financial liability arise at the hospital. These are IT withholding and SSI employer’s premium.

On the other hand, can not pay the fee for, only a physician who is called to the hospital in certain operations and no contract of service. This is because the physician will need to issue a receipt directly to the patient for the service he / she has done. The hospital costs will be billed to the patient by the hospital. In such a case, the physician will arrange the receipt, and the hospital will pay the amount of VAT after the stoppage. Then the physician will be able to deduct IT withholding by filing a tax return at the end of the temporary tax periods and at the end of the year.

Another situation seen in private hospitals is that physicians should provide service to the hospital by establishing a limited liability company. In this case, the company in which the physician is a partnership contract with the hospital and allocates the doctorate service to be provided from his / her partner or employees, that is, the workforce to the hospital for a certain amount of money. In such a case, the company will deduct the VAT inclusive of the VAT from the hospital every month for the duration of the contract and collect the fee. The Company also distributes these shares to its shareholders as its profit share.
### Table 9: Incentives Provided to the Health Sector

<table>
<thead>
<tr>
<th>Supporting Elements Provided to Health Sector in Incentive Applications</th>
<th>Territorial</th>
<th>Large-Scale</th>
<th>Strategic</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supporting Features</strong></td>
<td>IV</td>
<td>V</td>
<td>IV</td>
<td>V</td>
</tr>
<tr>
<td><strong>VAT Exemption</strong></td>
<td>Available</td>
<td>Available</td>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td><strong>Customs Tax Exemption</strong></td>
<td>Available</td>
<td>Available</td>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td><strong>Tax Discounting (%)</strong></td>
<td>Investment Contribution Rate (%)</td>
<td>Out of OSB</td>
<td>70-30</td>
<td>80-40</td>
</tr>
<tr>
<td></td>
<td>In the OSB</td>
<td>80-40</td>
<td>90-50</td>
<td>80-50</td>
</tr>
<tr>
<td><strong>Insurance Primer Employee Relief Support</strong></td>
<td>Out of OSB</td>
<td>6 years</td>
<td>7 years</td>
<td>6 years</td>
</tr>
<tr>
<td></td>
<td>OSB internals</td>
<td>7 years</td>
<td>10 years</td>
<td>7 years</td>
</tr>
<tr>
<td><strong>Investment Place Bullion</strong></td>
<td>Available</td>
<td>Available</td>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td><strong>Interest Support</strong></td>
<td>TL Credit</td>
<td>4 points</td>
<td>5 points</td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td>Currency / Forex Indexed Loan</td>
<td>1 point</td>
<td>2 points</td>
<td>Off</td>
</tr>
</tbody>
</table>

**Source:** Private Health Centers Investment Process.

It is known that in the case of establishing private hospitals, some support is provided by the government in the framework of incentive implementation. For example, the government provides facilities for companies in a variety of subjects and areas such as customs tax exemption, tax reduction, insurance premium support, interest support for investments and investment site provision.

### Appreciation Analysis and Conclusion

Health spending is rapidly increasing in the world and our country. After 1980, the function of the social welfare state was restricted with neoliberalism spreading to the world as the dominant view. Many countries have had to accept this teaching with the imposition of international institutions such as the World Bank and the IMF. As a natural consequence of this, the social spending of the countries has been reduced. As the conclusion of the Classical Economics Theory, with the validity of the notion of "night watchman state" in the public, national security and diplomacy, education and health services now reflect the paternalistic direction of the state which has seen trying to keep the social state conception alive. As neoliberal doctrine is built on inequality and competition, the reduction of social spending is extremely vital in the direction of this doctrine. The state, which is constrained and forced to shrink, increasing
demands for health and education services are on the way to regulating from the beginning, in the name of reforms.

The social burden on the back of the Ministry of Health have been loaded into SSI, and this burden has been reflected the individuals through legal regulations with Health Transformation Program (HTP) implemented in the health field in 2003. In addition to the negative consequences of HTP, some improvements have also been observed. Turkey has close to average in OECD countries; infant mortality rates have decreased, lifetimes have been extended. It is also aimed that social security institutions are gathered under one roof and services are presented in line with equitable principles. However, in order to reduce the increase in demand for health services, such factors as contribution rates have been introduced. In addition to the increase in demand for health services, out-of-pocket payments made by households have also increased in order to benefit from this service. In the coming years; it will not be too surprising that the reduction of the role of the state in health expenditures with the increase of various applications such as participation fee, supplementary fee, a difference of faculty member, complementary health insurance.

As a result, it is possible for the private sector to be able to operate in the field of health, under conditions where profitability in market conditions is low, and the risk ratio is low. In this framework, it has been tried to show how the private sector has a large share in the health sector over the years. At the same time, taxes and obligations have also been discussed in the study, the fact that private hospitals are a firm.
References


PART I.

CHAP 3.

OCCUPATIONAL HEALTH AND SAFETY IN HEALTHCARE SECTOR IN TURKEY

Deniz Tugay ARSLAN *, Jebağı Canberk AYDIN**

Introduction

According to the 1951 joint committee of the World Health Organization (WHO) and the International Labor Organization (ILO), occupational health is defined as: protection, development, maintenance at the highest level of the physical, mental and social well-being of all employees in all professions and ensuring the harmony between the work and worker and between the worker and himself. The aim of occupational health is to protect health of employees (maintain and improve health status), to treat and rehabilitate sick workers. Job security is expressed as the whole of the measures to be taken in order to prevent the employees from being involved in work accidents during their work to ensure their livelihood and to establish a safe working environment. (Saygun, 2012; Solmaz ve Solmaz, 2017).

In today's conditions where globalization is dominant, the qualitative and quantitative changes in the means of production as a result of developing production technologies can lead to various negativities in working conditions in the workplace. It can be stated that various preventive purchasing practices have been carried out on these negative working environments which threaten employee health and safety and that these applications differ between countries and sectors. It is the right of every employee to work in a healthy and secure environment in a decent manner. Therefore, there is a need for legislative arrangements and the implementation of these regulations (Tüzüner and Özaslan, 2011; Saygun, 2012).

There is also an economic impact of occupational health and safety which is a global problem. Every year more than 3.2 million people lose their lives as a result of work-related accidents and diseases. In addition, 300 million non-fatal work accidents with 160 million occupational disease cases occur every year. The economic burden created by work-related diseases and deaths and the loss of productivity correspond to 4% of the global Gross Domestic Product (GDP). Therefore, ensuring and promoting a safe and healthy work environment should be a priority (International Labor Organization, 2016).

---

* Research Assistant, Eskisehir Osmangazi University, d.tugayarslan@gmail.com +90 554 463 3574
** Research Assistant, Cumhuriyet University jcanberkaydin@gmail.com +90 555 535 7725
Employers and employees are the two main sides of the business life. Establishing a safe and productive business life will bring benefit to both parties. The society and the state will benefit from an efficient working environment. With the legislation set out in the field of occupational health and safety in Turkey, regulating the relations between two parties and securing the establishment of a business life are intended. Implementing occupational health and safety measures, contributing to the reduction of work accidents and occupational diseases; employees, employers and social security systems reveals important and positive results (Koenig and Avsallı, 2012; The International Labor Organization, 2016).

The hospital, which is one of the health institutions, is a place where health services are offered as well as a workplace. Medical personnel working in hospitals are exposed to some biological, chemical, physical, psychological, environmental, mechanical and biomechanical risks depending on the work environment and the work done. Such risks and threats are a health hazard for medical personnel. Taking occupational health and safety precautions for health personnel working at the hospital will have an impact on the health of the medical personnel as well as the quality of the health service offered to the community (Devebakan, 2007).

**Historical Development of Occupational Health and Safety in the World**

Occupational health and safety practices have gained scientific meaning today by passing through different stages in the historical process. Starting with the struggle of mankind with the nature and developments passing through different stages in business life, have ensured that problems of work health and safety come to the fore. Interest in occupational health and safety began in the era of Ancient Greek. Hippocrates (460-370 BC) studied on lead poisoning in the mines and Roman Pliny (23-27 AD) took the toxic effects of lead and sulphate on consideration and made skin masks, the first personal protection tool. In the 2nd century AD, the Greek physician Galen examined the pathology of lead poisoning and the harms of acid vapors in copper mines. With the contrast to science in Middle Ages, this kind of studies had also been interrupted. Work on health and safety continued with Renaissance (1500-1800 AD) (Yılmaz, 2003; Şen, 2015).

Italian medical professor Bernardino Ramazzini (1633-1714), known as the founder of the concept of occupational health, tried to identify "employee-work-health" relationships by asking to his patients their professions and detailed work stories. He mentions occupational diseases systematically in his book "Diseases of Workers" and refers to chemical substances, dusty environments, heavy metals, repetitive and violent movements, faulty postures and disease-causing agents (Şen, 2015).

With the industrial revolution which first emerged in England in the first half of the 18th century, the nature of production process was fundamentally changed. With the developing
technology of the industrial revolution in England, there has been an unprecedented increase in the amount of production. In line with the large production facilities and the developments in which they were built, the working class, who is dependent on the employer and work for the wage, grew gradually and various health and safety problems emerged as a result of this class's working conditions, the work-related risks and the accidents. In this period, many factors such as the increasing working hours and the employment of children and women workers in bad and heavy conditions have brought up the necessity of Government's intervention to the working life (Tüzün and Özalşan, 2011, Çiçek and Öçal, 2016).

After the industrial revolution, political pressure groups emerged that would ensure addressing the problems of workers' health. Parallel to industrialization, industrial countries have implemented various legal regulations. In 1746 Goldschmied invented the first protector, the ferrule, to prevent the needle from sinking into the finger of those who stitch. The American and French Revolution and trade union activities, with the help of the press, have made social issues more effectively handled in the UK. In the ongoing process, the Law on Health and Morals, enacted in 1802, tried to hinder apprentices and misuse of their labor. Trade union activities that were banned up to 1824 were legalized and slavery was abolished. On August 7, 1996, the Law on Occupational Health and Safety came into force in Germany. In 1970, the Occupational Safety and Health Act (OSHA) was adopted in the United States. In 1972, the Circular on Occupational Health and Safety was adopted, which obliged the employment of occupational physicians and workplace safety personnel. In 1974, the law of occupational health and safety named "Health and Safety at Work Act" was published in England (Tüzün and Özalşan, 2011, Aydin, 2014, Şen, 2015).

Resolving the health and safety-related problems created by the changes in the working life, provided the development in the field of occupational health and safety. In this context, international organizations have emerged that act effectively on occupational health and safety. The International Organization for Labor (ILO) (1919), the World Health Organization (WHO) (1946) and the European Agency for Safety and Health at Work (OSHA) (1994) are those that should be counted first from these (Shen, 2015).

Historical Development of Occupational Health and Safety in Turkey

The first regulations on occupational health and safety in the Republic of Turkey in 1921 coincides with the date prior to the proclamation of the Republic. In these years, Zonguldak and Ereğli Coal Operations, which have heavy working conditions in order to be able to sustain coal production uninterruptedly, emphasized business health and safety issues and two successive laws were enacted. Laws 114 and 151 introduced provisions for regulating the working conditions of coal workers. In 1921, at the First Congress of Economics; a number of decisions were taken such as providing the right to association and trade union, not more than
4 hours of night time work, not more than 6 hours of daily working time in mining establishments, not minor workers working in mines, 8 hours of working time limit, and providing women employees various rights in case of pregnancy. Some of these decisions still remain valid today (Baradan, 2006).

Due to the lack of occupational health and safety laws in Turkey, Occupational Health and Public Hygiene Act and the Municipalities Act that contains sections relating to the security entered into force in 1930. Later, with the Labor Law No. 3008 that came into force in 1936 which covers many issues of business life, detailed regulations were made about the occupational health and safety for the first time in Turkey. According to the provisions of the law No. 3008, the Ministry of Labor was established in 1945 and social security was included among the duties of ministries. By this means, social security appeared in the legislation for the first time. In order to carry out the work on health and safety from one source, it was given to the General Directorate of Workers Health after the establishment of the Ministry of Labor. Following this mandate, law no. 1790 on the appointment of technical personnel such as physicians, chemists and engineers to supervise workplaces in terms of worker health and work safety, to adjust working life and to give guidance in accordance with the law numbered 5690 has been came into force. In lieu of the Labor Act No. 3008, which can not respond to the requirements of the day, the Labor Law No. 1475 entered into force in 1971. This law, supplied with the rules and regulations issued in terms of occupational health and safety, has brought contemporary and broadly detailed regulations in comparison with the previous labor law (Baradan, 2006, Çiçek and Öçal, 2016).

European Union accession process in Turkey, especially in the legislative arrangements since the 2000s has been based on the standards of the European Union. In 2003 the Labor Law No. 4857 was adopted with the effect of harmonization process of European Union. In the following years, a number of regulations have been issued on occupational health and safety based on the Labor Law No. 4857. Finally, Law No. 6331 on Occupational Health and Safety dated June 20, 2012 was adopted. Within the 6 months following the publication of the Law, certain articles of Law No. 4857 were abolished. Some of the items of the Law on Occupational Health and Safety No. 6331 have gradually entered into force within the years (Korkmaz and Avsallı, 2012; Şen, 2015, Çiçek and Öçal, 2016).

Law No. 6331 on Occupational Health and Safety consists of 5 sections and 39 items. The purpose of the law is to regulate the duties, authorities, responsibilities and obligations of the employers and employees in order to ensure the health and safety of the workplace and to improve the existing health and safety conditions. This law is applied to all employees and businesses belonging to the public and private sector, to employers of these enterprises and to their employer representatives, apprentices and apprentices, irrespective of their activity (Official Gazette, 2012). The first part of the five-part law; purpose, scope and definitions, second part;
duty, authority and obligations of employers and employees, third part; council, board and coordination, fourth chapter; inspection, examination, investigation, authority, liability and responsibility of the inspector, fifth chapter; varied and temporary provisions. According to the Article Law No 30, the Ministry of Labor and Social Security has been assigned to prepare the necessary regulations for the implementation of the law by taking into consideration the relevant ministries. The Ministry of Labor and Social Security is obliged to prepare the necessary legislation in order to prevent malfunctions and problems in practice and to guide the practitioners (Resmi Gazete, 2012, Korkmaz and Avsallı 2012).

Law No. 6331 on Occupational Health and Safety has set general rules for the employer to take about work safety and health precautions not only for workers but also for protection of all employees. The provisions of regulations issued based on this law are mandatory legal rules. Article 4 of the Law refers to the liability and obligation of employers and workers in occupational health and occupational health areas. Generally, in the Law on Occupational Health and Safety No. 6331, all precautions for work safety and health, keeping tools and utensils faultlessly, training of workers, employee representative, right to avoid working and sanctions to be applied when the provisions of the law are not followed, are found. Occupational Safety Act No. 6331 on labor and social security law, Act No. 5510 on Social Security and General Health Insurance Law, Law No. 6098 Code of Obligations which are common laws on contain provisions for occupational safety and health (Korkmaz and Avsallı , 2012; Sadullah, 2015).

**Occupational Health and Safety in Healthcare Sector**

Today, healthcare staff, as well as the occupational risks they are exposed in other sectors, are facing different occupational risks depending on the nature of the work they are doing. Existing risks lead to reduced performance of healthcare staff, increased job accidents and adversely affect the safety of both employees and patients. Providing safe, qualified and efficient health services depends on a working environment that supports the capacity of healthcare staff and the perfection of performance (Meydanlıoğlu, 2013).

The International Labor Organization (WHO) stated in the 1970s that healthcare staff have the right to "be healthy" and "work in a healthy and safe hospital environment", and that can be achieved through the establishment of the relevant units in hospitals. Following this, the International Labor Organization, took decisions on the provision and development of the organization of staff’s health and safety services directed to healthcare staff in each country in 1985. The International Commission on Occupational Health stated in 1990 that the health of healthcare staff should be addressed through the occupational health approach and the relevant units should be established in hospitals (Özkan and Emiroğlu, 2006).
As happened in all the sectors, there has been a reflection of health and safety practices in the healthcare sector as well. The Regulation on the Ensuring the Safety of Patients and Employees published by the Ministry of Health on 6 April 2011 and the Law on Occupational Health and Safety No. 6331 published in 2012 have enabled the healthcare staff to benefit from occupational health and safety services. In the following period, it was requested to establish personnel safety units for hospitals with the Regulation on Ensuring Patient and Employee Safety (Resmi Gazette, 2011; Meydanlıoğlu, 2013). Within the scope of the Regulation on Ensuring Patient and Employee Safety; hospitals were informed about the establishment of employee safety committees, the establishment of employee safety programs, the conduct of health screenings for employees, the regulations on the prevention of violence against healthcare staff, the establishment of programs for infection control and prevention, the introduction of white code, training of employees on employee safety (Resmi Gazette, 2011).

In the Communiqué on Workplace Hazard Classes Regarding Occupational Health and Safety, the Ministry of Labor and Social Security stated that hospitals were in the dangerous workplace class (Official Gazette, 2014). When considering the impact of the services offered by hospitals on the health of the community, it is important to evaluate the conditions and working conditions of the healthcare staff, therefore, firstly the hazardous factors should be well known. It is important to evaluate the environment and working conditions of the healthcare staff. For this, it is necessary to know the hazards and risk factors which disrupt health in working environments, to take protective measures and to inform them about these factors (Saygun, 2012).

When the literature is examined, the hazards and risks that threaten the health of healthcare staff grouped as; chemical (solvent, anesthesia, antineoplastic drugs, metals, Hg), biological (infection, respiratory, tuberculosis, hepatitis b, hepatitis c, aids) ergonomic-physical (noise, vibration, heat and cold, incision, stinging, radiation, standing, weight removal, violence, assault) and psychosocial (shift, night work, long work, stress, workload, occupational satisfaction). The National Institute of Occupational Health and Safety in the United States has reported 29 types of physical, 25 types of chemicals, 24 types of biological, 6 types of ergonomic and 10 types of psychosocial hazards and risks are present in hospitals (Özkan, 2006; Öztürk, et al., 2012, Meydanlıoğlu, 2013, Akgün, 2015). If health and safety precautions are not taken against hazards and risks, it is assumed that these health problems will increase occupational mistakes (Aiken, et al., 2002).

In line with the risk factors stated, by the National Institute of Occupational Health and Safety, evaluation on 2600 hospitals’ occupational health departments reports that the most frequent complaints were muscle and skeletal twitches and ruptures in healthcare staff. This is followed by penetrating injuries, scratches, crushing, laceration, back-lumbar damages, burns and fractures. The most common diseases were respiratory problems, infection, dermatitis, drug and treatment reactions (Saygun, 2012).
Several studies in Turkey were carried out to determine the factors affecting the health of healthcare staff in the hospital setting and to identify health problems that workers faced. Healthcare staff in Turkey catch various diseases due to biological risk factors. According to a study by Sayın - Kutlu et al. (2012) done in infection and microbiological units of 38 hospitals, determined that %5.8 of 667 employees were infected with laboratory-borne brucella disease. The biological risks associated with hepatitis B, C and HIV have started to be influenced by globalization as well as the development of new infections and the appearance of the existing ones in different geographical areas. Nearly 10 healthcare staff lost their lives because of the Crimean Congo. In addition, the measles outbreak that started in 2012 affected many healthcare staff (Davas, 2014).

Silicosis, a common occupational disease in mines due to chemical threats, is found in healthcare personnel working in dental prosthesis laboratories (Özkan, 2013). The chemicals used during the service presentation can be taken by the healthcare personnel in various ways such as skin, digestion, respiration, pinning (Solmaz ve Solmaz, 2017). Within the framework of ergonomic and physical risks, healthcare personnel are experiencing musculoskeletal problems. Altınel et al. (2007) discovered in his studies that healthcare personnel encounter lifelong back pain and chronic back pain problems. There are studies showing that light and electromagnetic fields affect pineal gland function. In the long term, it can cause breast cancer, reproductive function problems and depression. Within the scope of physical and ergonomic risks, various diseases caused by noise, bad ventilation, electricity and radiation are observed in healthcare personnel (Akgün, 2015).

In direction of psychological risk factors, inadequacies in health service and imbalances in employee distribution are causing loss of motivation and state of stress in the workplace. Occupational stress due to psychosocial risk factors can affect the health of the health worker. Factors such as fear of losing a job, economic difficulties, excessive workload, lack of job control, overtime, working speed, occupational independence are mentioned as reasons of work stress. Employees may experience stress exhaustion, depression, anxiety, forgetfulness, restlessness, aggression, nervousness, fatigue without rest, alcohol, smoking and harmful substances. Exhaustion is a common problem, especially in the service sector. Healthcare personnel are known to be one of the riskiest groups in terms of exhaustion (Günüşen and Üstün, 2010, Tokmak, et al., 2011, Toh, et al., 2012, Davas, 2014; Mobbing (psychological violence) is another important psychosocial factor that frequently affects the health of healthcare personnel. Healthcare personnel exposed to mobbing; are exposed to behaviors that can cause psychological abuse, such as deprivation, intimidation, exclusion, deprivation of institutional services, humiliation, taking advantage of permits, and recruitments (Aksoy, 2008). In general, it is stated that mobbing can lead to decrease of job satisfaction, depression, excitement and separation from work (Demirel and Yoldaş, 2008; Solmaz and Solmaz, 2017). Another important factor that threatens occupational health and safety is physical violence against healthcare personnel. In
the healthcare sector, all healthcare personnel, especially doctors and nurses, are at risk for violence. Surveys indicate that the risk of suffering from violence is 16 times higher in healthcare personnel compared to other service sector groups. As a result of the acts of violence the health worker experienced, as simple or serious physical injuries, temporary or permanent incapacity, psychological trauma, fear, anger, sleep disturbance, headache, productivity, separation from work, increase in error, disappointment and death might occur (Özcan Keser and Bilgin, 2011, Akgün, 2015, Arslan and Mut, 2016).

The necessity of keeping records and examining on the Occupational health and safety systems in hospitals, occupational diseases and hazardous situations are problems accepted by both national and international experts (Akgün, 2015). Within this scope, as a basis of the program to be carried on for establishing occupational health and safety in hospitals (Özkan, 2005; Meydanlıoğlu, 2012; Akgün, 2015):

- Identification of possible risks and hazards in hospitals and taking precautions,
- Presentation of health and safety trainings,
- Regulations in the working environment,
- Entrance examination for a full medical history,
- Performing periodic examinations,
- Providing health counseling services,
- Establishment of the health and safety record system,
- Coordinated operations of hospital departments and services,
- Development of motivation programs for healthcare personnel,
- The evaluation of the construction of the hospital to be built or repaired in terms of health and safety during the planning phase,
- Offering a vaccination service,
- Conducting environmental control and monitoring,
- Conduct of accident investigations,
- Informing the health personnel about the identified hazards and risks,
- Taking the management and trade union support must be included.

According to the United States Occupational Safety and Health Administration, the employee safety units to be established in hospitals are considered to be health care facilities that provide first-line health care that improves, protects, prevents disease and outpatient health services for healthcare personnel. In line with the Regulation on the Ensuring the Safety of Patients and Employees, the employee safety units established in the hospitals should act in this direction (Özkan and Emiroğlu, 2006: 45-46).
Conclusion

Healthcare sector, contains important hazards and risks in terms of healthcare personnel with regard to working conditions, working environment and the quality of work done. Healthcare staff in Turkey face many health problems such as needle pins, infectious diseases, waist and back problems, physical / verbal violence and stress. While healthcare personnel working in hospitals protect and develop the health of the community and the individual, they are also facing many risks and threats in terms of their own health. In this respect, hospitals in Turkey are classified as "very dangerous" workplaces.

In parallel to the globalization in the world and Turkey with changes in the healthcare sector; specialization, autonomy and privatization practices are realized in healthcare services. Being implemented in Turkey since 2003, the place of employment in the public health services in the Health Transformation Program, has begun to replace with the private sector applications. As a result of these applications healthcare personnel are faced with cases of delegation, flexibilisation, unionization, and subcontracting. Private sector; as a result of the public interest in the profit-oriented, competitive and market-oriented approach, employees have faced low wages, insecurity and poor working conditions. As a result of these applications, occupational accidents and occupational diseases are more common in healthcare personnel. In addition, violence against healthcare personnel is also increasing (Sağlık Çalışanlarının Sağlığı Çalışma Grubu, 2014).

Turkey, which began performance-based payment system implemented after the Health Transformation Program and provoked demands of business applications is also risking the health and safety of health professionals working in hospitals. Especially in recent years there has been an increase in violence against healthcare personnel. The removal of the referral system, the release of preventive health services on the second plenum, and the implementation of performance-based payment systems have forced healthcare providers to look at the patient more quickly. As a result, frequent conflicts occur between healthcare staff and patients and their relatives.

As well as development and improvement of occupational health and safety laws and regulations in Hospitals in Turkey, one of the most important problem encountered in the field is deficiencies in the application. The current legislation on occupational health and safety also places certain responsibilities on employers and employees. But often the problems arise in the course of the realization of these responsibilities. If the current legal regulations do not fully reflect the practice, the health of healthcare personnel is not possible to be improved.

Hospitals have a multidisciplinary structure which requires that all components related to the field (employer, employee, medicine, law, engineering etc.) should act jointly. In addition to this, it is important to strengthen the workers organizations in order to be able to implement occupational health and safety practices. The syndicates should quickly organize in this area,
take an active role in the establishment and operation of occupational health and safety units in their hospitals, be a follower of the relevant services and participate in occupational health safety boards. The relationship between the health of the healthcare personnel and the working conditions in hospitals may become visible by this means. For this, the pressure on the workers and trade union organizations of the employees should be removed and the organizations advocating the rights of the workers should be supported.

Data related to occupational health and safety in Turkey is explained by the Social Security Administration. The state, employer and employees are individually responsible in accordance with the data disclosed. Occupational health and safety related events need to be reported in a timely and complete manner. The data obtained should be analyzed by universities, trade associations and non-governmental organizations and should be supported by scientific studies. Without the data obtained on the basis of scientific principles, the determination of policies and the creation of the necessary strategy can not even be a matter of discussion. In addition, it will be possible to make the necessary arrangements by measuring the reflections of the policies determined in the direction of the obtained data.

One of the most important steps in achieving qualified and easily accessible health services suitable for human needs is to provide an environment of work health and safety in hospitals. That’s the only way, it is possible to achieve both the aims of healthcare personnel and those benefiting from the service. In Turkish healthcare sector, it is necessary for managers to fulfill the responsibilities in order to raise the level of occupational safety by creating a culture of occupational health and safety. In order for occupational health and safety activities to be carried out in the hospitals, the viewpoint of the top method should be changed and participation of the management supported employees should be provided. In addition, it is necessary that the Ministry of Health change its current understanding of occupational health and safety to ensure that current legislation is fully implemented, preventive and regulatory legal practices are introduced, supervision is tight, and trainings are allocated more time and budget.
References


Tenders Within The Scope Of Public Procurement Law

In Turkey, service procurement constitutes a significant part of managerial needs and these needs are addressed according to Public Procurement Law (PPL) No. 4734. Public procurement under the scope of PPL is the open tender to be carried out according to this law and the basic procedures applied among certain bidders. the tender procedure between the open tender procedure and certain tenderers is the other tender procedures include procurement which are under the scope of direct procurement and exemption and which can be used in special cases specified in the Law.

According to Law No. 4734; it includes marketing, communication, insurance, research and development, accounting, market research and survey, consulting, promotion, printing and publishing, cleaning, food preparation and distribution, meeting, organization, exhibition, protection and security, vocational education, photography, film, intellectual and fine arts, computer systems and software services, rental of movable and immovable property and rights, and other similar services.

Services in technical, financial, legal or related fields such as architecture and engineering, study and project, map and cadastre, zoning plan in all scales, zoning application, preparation of Environmental Impact Assessment (EIA) report, plan, software development, design and
preparation of technical specification are provided from consultancy service providers. The consulting services shall be tendered only in accordance with the provisions contained in this section between the bidders. However, the approximate cost of consultancy services that is less than four times the upper limit for service procurement specified in sub-section (no. 2) of section (b) of the 13th item can only be implemented with service procurement tender. The results of the tenders were submitted to the Public Procurement Authority in the first six months of 2017 and they were executed in accordance with the Law No. 4734.

As it is seen in Table 1.1; 40,22% of the tenders was related to goods purchasing, 18,21% construction work, 41,24% purchase of services and 0,33% consultancy services. When the amounts are evaluated on the basis of the amount, 16,49% of the total public procurement expenditures realized in accordance with the methods within the scope of the Law in the related period are goods procurement, 52,58% in construction work, 30,37% in service procurement and 0,56% consulting services.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
\textbf{Tender Type} & \textbf{Number of Public Procurements} & \textbf{Value of Public Procurements (1000 TL)} \\
 & \textbf{First Quarter of 2017} & \textbf{First Quarter of 2017} & \% & \% \\
\hline
Goods & 18,074 & 40,22 & 16,689,946 & 16,49 \\
Works & 8,157 & 18,21 & 53,221,653 & 52,58 \\
Services & 18,474 & 41,24 & 30,737,056 & 30,37 \\
Consultancy Services & 148 & 0,33 & 953,837 & 0,61 \\
\hline
Total & 44,793 & 100 & 155,661,190 & 100 \\
\hline
\end{tabular}
\caption{Distribution of Public Procurement Types (Public Procurement Monitoring Report, 2017)}
\end{table}

In Table 1.2, public procurements carried out under the Law No. 4734 are classified according to the funding source of the tender. According to the results, in the first six months of 2017, 34,75% of the total amount of the tenders whose contractual information reached to the authority was covered by the municipal budget, 25,88% from the special budget, 9,07% from the general budget and 8,76% the accounting budget.
Table 1.2 Distribution of Administrative Agencies by Source of Financing
(Public Procurement Monitoring Report, 2017)

<table>
<thead>
<tr>
<th>Sources of Finance</th>
<th>Number of Public Procurements</th>
<th>Value of Public Procurements (1.000 TL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Budget</td>
<td>11.357</td>
<td>9.181.808</td>
</tr>
<tr>
<td>SGK (Social Security Institution) Budget</td>
<td>218</td>
<td>301.748</td>
</tr>
<tr>
<td>Revolving Fund Budget</td>
<td>7.129</td>
<td>8.867.885</td>
</tr>
<tr>
<td>Special Budget</td>
<td>5.075</td>
<td>26.194.140</td>
</tr>
<tr>
<td>Regulatory and Supervisory Authority Budget</td>
<td>54</td>
<td>70.278</td>
</tr>
<tr>
<td>Municipality Budget</td>
<td>13.834</td>
<td>35.173.391</td>
</tr>
<tr>
<td>Special Provincial Administration Budget</td>
<td>1.744</td>
<td>1.489.952</td>
</tr>
<tr>
<td>Local Administration Union Budget</td>
<td>186</td>
<td>79.047</td>
</tr>
<tr>
<td>SOE Budget</td>
<td>1.703</td>
<td>6.803.795</td>
</tr>
<tr>
<td>Other</td>
<td>3.493</td>
<td>13.050.007</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>44.793</strong></td>
<td><strong>101.212.051</strong></td>
</tr>
</tbody>
</table>

The aforementioned expenditure will be done in accordance with the provisions of the Public Procurement Law No. 4735. The contracting process of service purchases is an important area that has many disciplines, which is why it needs to be delicately focused on. The convention shall be established by mutually and consentaneously expressing the parties’ will and shall be accomplished by signing the contractual agreement within the framework of the provisions of Law No. 4734. At this point, service procurement tenders can be defined as the procurement of services from third parties which are expressly stated in the Law No. 4734 or which carry such features.

In order to be able to go out to tenders for works covering more than one year with an aim of first completing the health investment projects of T.R. Ministry of Health and bringing it in the economy, it is crucial to make sure that the contractor acts in accordance with the duration of the work by years in the work program indicated in the tender document. In this context, the selection of the best contractor considering the non-price factors with the help of the parametric model developed with fuzzy AHP method will contribute to the decisions of the tender commission related to work and project tenders (service procurement) by the General Directorate of Health Investments.

**Fuzzy AHP**

Analytic Hierarchy Process (AHP), created by Thomas L. Saaty in 1977, is one of the multiple-criteria decision making methods which enables to evaluate qualitative and quantitative factors
Determining and weighting of non-price factors using fuzzy analytic hierarchy process in the context of cost - effectiveness, efficiency and economy in health investment projects service procurement decisions

Orhan PARILDAR, Çağdaş AKYUREK, Sukru Anil TOYGAR

(Özbek ve Eren 2013). The AHP method has a hierarchy of objectives, criteria, and goals. In this method, in accordance with the decisions of the decision makers, the objective is to select the most appropriate alternative by evaluating the goal-based criteria and criteria-based alternatives.

The AHP method does not include the uncertainty in personal evaluations. Saaty exploited the fuzzy logic approach to reflect these uncertainties into a model and developed the Fuzzy AHP method. With the fuzzy AHP approach, linguistic variables can be used in binary comparison matrices of both criteria and alternatives. These linguistic variables are expressed through triangular numbers. Fuzzy AHP uses many methods. In this study, each stage in the study was considered as a criterion, and Buckley’s method was used in determining the weight of the criterion. Ayhan lists the steps that are taken in this method as follows (Ayhan 2013). In Table 2.1, the correspondences between the linguistic alternatives and the triangular fuzzy numbers are given. For example, if the first criterion has a weaker criterion than the second criterion, it takes the value (2,3,4) on the triangular fuzzy scale. On the other hand, criterion 2 in the binary comparison matrix will have a value (1 / 4, 1 / 3, 1 / 2) when compared to criterion 1.

**Step 1.** The decision makers compare the alternatives to the writer and the alternatives shown in Table 2.1.

<table>
<thead>
<tr>
<th>Saaty Scale</th>
<th>Definition</th>
<th>Fuzzy Triangular Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Equally important</td>
<td>(1,1,1)</td>
</tr>
<tr>
<td>3</td>
<td>Weakly important</td>
<td>(2,3,4)</td>
</tr>
<tr>
<td>5</td>
<td>Quite important</td>
<td>(4,5,6)</td>
</tr>
<tr>
<td>7</td>
<td>Very important</td>
<td>(6,7,8)</td>
</tr>
<tr>
<td>9</td>
<td>Definitely important</td>
<td>(9,9,9)</td>
</tr>
</tbody>
</table>
| 2 / 4       | The interval value          | (1,2,3) /
| 6 / 8       | between two consecutive     | (3,4,5) /
|             | scales                      | (5,6,7) /
|             |                             | (7,8,9)                |

The binary comparison matrix is given in equation 1. In the equation \( (d_{ij}^k) \), the preference of i. criterion over j. criterion according to k. decision maker through triangular fuzzy number is expressed. Here, "\(-\)" indicates a triangular number. For example, \( (d_{12}^1) \) refers to the preference of the first criterion according to the first criterion, and corresponds to the value \( (d_{12}^1) = (2,3,4) \) according to the equation.
Step 2. If there are more than one decision maker here, the averages of each decision maker’s preferences (\(\overline{d}_{ij}^k\)) are taken and \((\overline{d}_{ij})\) is calculated as in equation 2.

\[
\overline{d}_{ij} = \frac{\sum_{k=1}^{K} \overline{d}_{ij}^k}{K}
\]  

(2)

Step 3. According to preference averages, the binary comparison matrices have been updated as shown in equation 3.

\[
\tilde{A} = \begin{bmatrix}
\overline{d}_{11} & \cdots & \overline{d}_{1n} \\
\vdots & \ddots & \vdots \\
\overline{d}_{n1} & \cdots & \overline{d}_{nn}
\end{bmatrix}
\]  

(3)

Step 4. The fuzzy comparison values of each criterion are calculated according to equation 4 via the geometric mean. Here, \((r_l)^\gamma\) is still a triangular number.

\[
\tilde{r}_i = (\prod_{j=1}^{n} \overline{d}_{ij})^{1/n}, i = 1, 2, \ldots, n
\]  

(4)

Step 5. The weight of each criterion is calculated via equation 5. These calculations are summarized in three sub-steps.

Step 5a: The vector sum of each \((r_l)^\gamma\) value is found.

Step 5b: Vectoral totals are reversed. It is replaced by triangular fuzzy numbers and sorted in ascending order.

Step 5c: i. The fuzzy weight of the i. criterion \((w_l)^\gamma\) is found. The opposite of these vectors is multiplied by each \((r_l)^\gamma\) value.

\[
\tilde{w}_i = \tilde{r}_i \otimes (\tilde{r}_1 \oplus \tilde{r}_2 \oplus \ldots \oplus \tilde{r}_n)^{-1}
= (lw_i, mw_i, uw_i)
\]  

(5)

Step 6: \((w_l)^\gamma\) is still a triangular fuzzy number. These numbers need to be clarified through equation 6.

\[
M_i = \frac{lw_i + mw_i + uw_i}{3}
\]  

(6)

Step 7: \(M_i\) is no longer a fuzzy number. However, it needs to be normalized. Normalization is performed via equation 7.

\[
N_i = \frac{M_i}{\sum_{i=1}^{n} M_i}
\]  

(7)
Here we show how the normalized weights of the criteria and alternatives are found in 7 steps. After the weight of each alternative is multiplied by the related criterion, the score of each alternative is calculated. According to these results, the alternative decision maker with the highest score is recommended (Ayhan 2013, Transporter: Uçar, İşlayan ve Demir 2015).

It should be determined whether the fuzzy the binary comparison matrix generated is consistent. The classical AHP method was used to determine the consistency of the matrix. In this context, fuzzy the binary comparison matrix is first clarified. The clarified matrix is normalized and percent weighted weights are calculated. Then the largest eigenvalue ($\lambda_{\text{max}}$) is calculated and this value is used in equation 9 to determine the value of the consistency indicator. The consistency rate is calculated by dividing the value of the consistency indicator by the value of the randomness indicator. A value less than 0.1 indicates that the matrix is consistent. The triangular fuzzy number is shown as $M = (1, m, u)$. Where 1 is the lower limit, m is the middle value, and u is the upper limit. These values are clarified through equation 8 and a single value is obtained (Göksu and Güngör 2008).

$$M_d = \frac{l+4m+u}{6}$$

The authenticity of the results of fuzzy AHP depends on the consistency of the binary comparisons that decision makers have made between choices or criteria. In this context, consistency analysis is performed and the consistency rate is calculated. The consistency rate determines the erroneous and exaggerated evaluations that the decision makers have made between the options and aims to obtain realistic results by eliminating the identified mistakes. The operations to be performed for the consistency rate account are given in equations 9 and 10 (Özden 2008).

$$\text{Consistency indicator} = \frac{\lambda_{\text{max}} - n}{n-1}$$

$$\text{Consistency ratio} = \frac{\text{Consistency Index}}{\text{Randomness Index}}$$

<table>
<thead>
<tr>
<th>Dimension of Matrix</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casualness indicator</td>
<td>0</td>
<td>0</td>
<td>0,52</td>
<td>0,89</td>
<td>1,11</td>
<td>1,25</td>
<td>1,35</td>
<td>1,40</td>
<td>1,45</td>
<td>1,49</td>
</tr>
</tbody>
</table>

The criteria and sub-criteria for determining the non-price elements in the fuzzy AHP and Service Procurement Tenders are given in Table 2.3.
### Table 2.3 Non-Price Factors

<table>
<thead>
<tr>
<th>BASIC CRITERIA</th>
<th>SUB-CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Competence</td>
<td>General Service Experience</td>
</tr>
<tr>
<td></td>
<td>Special Service Experience</td>
</tr>
<tr>
<td></td>
<td>Personnel Status</td>
</tr>
<tr>
<td></td>
<td>Documents Related to Research and Development, Standard and Quality</td>
</tr>
<tr>
<td>Service Quality</td>
<td>Number of Contracts</td>
</tr>
<tr>
<td></td>
<td>Number of Completed Projects</td>
</tr>
<tr>
<td>Financial Capacity</td>
<td>Sum of Contract Amount</td>
</tr>
</tbody>
</table>

- **General service experience**: The sum of years of direct experience in business and related matters. (The beginning year indicated in Commercial Registry Gazette will be taken as basis)
- **Special Service Experience**: The sum of years of experience in matters related to similar works (works in the similar group of works to be tendered in the Communiqué on the Unit Costs of Construction in 2017 to be used for the Architecture and Engineering Service accounts).
- **Personnel Status**: The total number of engineers and architects that the bidder employs in the business. (Social Security Institution will be requested)
- **Documents related to Research and Development, Standard and Qualifications**: Quality documents or the number of national or international documents taken regarding the subject of the tender. Freelance Architectural Services Office Registration Certificate, Freelance Consultancy Engineering Office Registration Certificate, etc.)
- **Number of Contracts**: The number of the contracts made with the administration within the scope of similar work as of the date of the tender date.
- **Number of Completed Projects**: The projects completed by the bidder in the bidding year and before the last 5 years.
- **Sum of Contract Amount**: Sum of the contract prices excluding the VAT in TL in the last 5 years prior to the date of the tender date of the works requested by the Contractor.

Implementation Projects have been determined using 3 Basic Criteria and 7 Sub-Criteria as non-price factors in the service procurement. In order to determine the weight of each criterion over the other criteria, some of the control engineers in the relevant section have been consulted. The obtained results are reflected in Table 2.4 by arranging the binary comparison matrix.
DETERMINATION AND WEIGHTING OF NON-PRICE FACTORS USING FUZZY ANALYTIC HIERARCHY PROCESS IN THE CONTEXT OF COST – EFFECTIVENESS, EFFICIENCY AND ECONOMY IN HEALTH INVESTMENT PROJECTS SERVICE PROCUREMENT DECISIONS
Orhan PARILDAR, Çağdaş AKYUREK, Sukru Anil TOYGAR

Table 2.4 Pairwise comparison of criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Criteria 1</th>
<th>Criteria 2</th>
<th>Criteria 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria 1</td>
<td>(1,1,1)</td>
<td>(4,5,6)</td>
<td>(6,7,8)</td>
</tr>
<tr>
<td>Criteria 2</td>
<td>(1/6,1/5,1/4)</td>
<td>(1,1,1)</td>
<td>(2,3,4)</td>
</tr>
<tr>
<td>Criteria 3</td>
<td>(1/8,1/7,1/6)</td>
<td>(1/4,1/3,1/2)</td>
<td>(1,1,1)</td>
</tr>
</tbody>
</table>

The geometric mean of the fuzzy comparison values of each criterion is calculated and given in Table 2.5.

Table 2.5 Geometric mean of fuzzy comparison value

<table>
<thead>
<tr>
<th>Criteria</th>
<th>$\tilde{r}_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria 1</td>
<td>2.88 3.27 3.63</td>
</tr>
<tr>
<td>Criteria 2</td>
<td>0.69 0.84 1</td>
</tr>
<tr>
<td>Criteria 3</td>
<td>0.32 0.36 0.44</td>
</tr>
</tbody>
</table>

| Total | 3.89 4.47 5.07 |
| Reverse (-1) | 0.26 0.22 0.20 |
| Ascending Order | 0.2 0.22 0.26 |

Table 2.6 The relative fuzzy weight of each criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>$\tilde{w}_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria 1</td>
<td>0.58 0.72 0.94</td>
</tr>
<tr>
<td>Criteria 2</td>
<td>0.14 0.19 0.26</td>
</tr>
<tr>
<td>Criteria 3</td>
<td>0.06 0.08 0.11</td>
</tr>
</tbody>
</table>

Table 2.7 Normalized relative weight and average of criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>$M_i$</th>
<th>$N_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria 1</td>
<td>0.75 0.73</td>
<td></td>
</tr>
<tr>
<td>Criteria 2</td>
<td>0.20 0.19</td>
<td></td>
</tr>
<tr>
<td>Criteria 3</td>
<td>0.083 0.08</td>
<td></td>
</tr>
</tbody>
</table>

According to the results shown in Table 2.7, it is seen that Criterion 1 and Criterion 2 have the highest priority, and Criterion 3 has the lowest. Accordingly, the importance weights of the non-price factors were determined as K1 value "0.73", K2 value "0.19" and K3 value "0.08" respectively.
The most economically advantageous proposal in the area titled "Determination of the most advantageous proposal from an economic point of view" in the Administrative Provision Regarding the Proceeding shall be stated as follows, taking into account the price as well as the non-price factors. The evaluation will be carried out in 4 parts; "Offer Price", "Technical Competence", "Service Quality" and "Financial Capacity". While the total score was calculated, 70 points were determined as the price and 30 points as the non-price factor.

**Bid price scoring (BPS):** The bid price scoring will be done over 100 full points. Among the current tenderers, the tenderer with the lowest bid price (BP) quoted will receive 100 points and the bid scores for the other tenderers will follow the formula below:

\[
\text{BPS} = \left( \frac{\text{BP}_{\text{min}} \times 100}{\text{BBP}} \right)
\]

BPS: Bid Price Score

BP\(_{\text{min}}\): The lowest bid price offered among current bids.

BBP: Bid price offered by the bidder

**Technical Competence Score:** It will be evaluated over 100 points. The sub-criteria items subject to the technical competence rating of valid bidders are as in Table 2.8.

<table>
<thead>
<tr>
<th>SUB-CRITERIA</th>
<th>POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Service Experience</td>
<td>0-2 years 5 points 3-5 years 10 points 6-8 years 15 points 9-11 years 20 points over 12 25 points</td>
</tr>
<tr>
<td>Special Service Experience</td>
<td>0-2 years 5 points 3-5 years 10 points 6-8 years 15 points 9-11 years 20 points over 12 25 points</td>
</tr>
<tr>
<td>Personnel Status</td>
<td>0-3 pieces 10 points 4-7 pieces 20 points over 8 25 points</td>
</tr>
<tr>
<td>Documents Related to Research and Development, Standard and Quality</td>
<td>0-2 pieces 10 points 3-5 pieces 20 points over 6 25 points</td>
</tr>
</tbody>
</table>

\[
\text{TCS} = \left( \frac{100 \times \text{TCSB}}{\text{TCSmax}} \right)
\]

TCS: Technical Competence Score
TCSmax: The highest technical score offered among current bids.

TCSB: Technical Competence Score of Bidder

**Service Quality Scoring**: It will be evaluated over 100 points. The sub-criteria items subject to the rating of service quality of valid bidders are as shown in Table 2.9.

<table>
<thead>
<tr>
<th>SUB-CRITERIA</th>
<th>POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Contracts</td>
<td>0-2 adet 50 points 3-5 adet 30 points over 6 10 points</td>
</tr>
<tr>
<td>Number of Completed Projects</td>
<td>0-2 years 10 points 3-5 years 20 points 6-8 years 30 points 9-11 years 40 points over 12 50 points</td>
</tr>
</tbody>
</table>

SQS = \((100 * \text{SQSB}) / \text{SQSmax}\)

SQS: Service Quality Score

SQSmax: The highest service quality score offered among current bids.

SQSB: Service Quality Score of the bidder.

**Financial Capacity Scoring**: It will be done over 100 full points. The sub-criteria items subject to the financial capacity rating of valid bidders are as follows.

<table>
<thead>
<tr>
<th>SUB-CRITERIA</th>
<th>POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total of Contract Amount</td>
<td>0-500.000 TL 25 points 510.000-1.000.000 TL 50 points 1.000.001-2.500.000 TL 75 points over 2.500.001 TL 100 points</td>
</tr>
</tbody>
</table>

FCS = \((100 * \text{FCSB}) / \text{FCSmax}\)

FCS: Financial Capacity Score

FCSmax: The highest proposed financial quality score among the current bids.

FCSB: Financial Capacity Score of the Bidder

**Total Score** = Price Score * 70 + Financial Capacity Score * 2.4 + Service Quality Score * 5.7 + Technical Competence Points * 21.9

The program, developed with an aim of providing public benefit for the administration to support parametric models, non-price factors and decisions of commission in the service
procurement tender for "Implementation Projects" executed within the scope of General Directorate of Health Investments, was designed in Microsoft Visual Studio NET (C# .NET) language and operation of the system is shown in detail. (See Figure 2.1)
193.500,00 TL (VAT Excluded) upon the examination of the envelope (5); that the requested documents are complete and the proposal of the bid is 182.000,00 TL (VAT Excluded) upon the examination of the envelope (6); that the requested documents are complete and the proposal of the bid is 158.400,00 TL (VAT Excluded) upon the examination of the envelope (7); that the requested documents are complete and the proposal of the bid is 159.900,00 TL (VAT Excluded) upon the examination of the envelope (8) and the offered bids were pre-controlled by checking competence criteria, unpermitted confirmations and extra-low values in line with the provisions stated in the tender document. Economically advantageous from requests 1. It has been decided that the first bid is from ... company with 158.400,00 TL; the most advantageous bid is from ... company with 159.900,00 TL and a contract shall be landed with the company which offered seventh most economically advantageous offer and it has been decided that the decision should be submitted to the Bidding Authority.

The administration evaluated the monetary values and relative weights with regard to each bidder in terms of both offering the most economically advantageous bid on the basis of price and having three features: "Technical Competence", "Service Quality" and "Financial Capacity".

### Bid Scores

<table>
<thead>
<tr>
<th>Bidder</th>
<th>Bid Score</th>
<th>Offer Price of which is normalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bidder</td>
<td>279.000,00 TL</td>
<td>56.78</td>
</tr>
<tr>
<td>2. Bidder</td>
<td>176.845,00 TL</td>
<td>89.57</td>
</tr>
<tr>
<td>3. Bidder</td>
<td>173.000,00 TL</td>
<td>91.56</td>
</tr>
<tr>
<td>4. Bidder</td>
<td>172.000,00 TL</td>
<td>92.10</td>
</tr>
<tr>
<td>5. Bidder</td>
<td>193.500,00 TL</td>
<td>81.86</td>
</tr>
<tr>
<td>6. Bidder</td>
<td>182.000,00 TL</td>
<td>87.04</td>
</tr>
<tr>
<td>7. Bidder</td>
<td>158.400,00 TL (min)</td>
<td>100 points</td>
</tr>
<tr>
<td>8. Bidder</td>
<td>159.900,00 TL</td>
<td>99.07</td>
</tr>
</tbody>
</table>

1. Bidder's Bid Score = (158.400 * 100) / 279.000 = 56.78

2. Bidder's Bid Score = (158.400 * 100) / 176.845 = 89.57
3. Bidder's Bid Score = \( \frac{158.400 \times 100}{173.000} = 91.56 \)

4. Bidder’s Bid Score = \( \frac{158.400 \times 100}{172.000} = 92.10 \)

5. Bidder’s Bid Score = \( \frac{158.400 \times 100}{193.500} = 81.86 \)

6. Bidder’s Bid Score = \( \frac{158.400 \times 100}{182.000} = 87.04 \)

7. Bidder’s Bid Score = \( \frac{158.400 \times 100}{158.400} = 100 \)

8. Bidder’s Bid Score = \( \frac{158.400 \times 100}{159.900} = 99.07 \)

**Technical Competence Scores:**

<table>
<thead>
<tr>
<th>Bidder</th>
<th>TY1 / TY2 / TY3 / TY4</th>
<th>Total Score</th>
<th>Normalized Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bidder</td>
<td>25 / 25 / 10 / 10</td>
<td>70</td>
<td>77.78</td>
</tr>
<tr>
<td>2. Bidder</td>
<td>15 / 15 / 20 / 10</td>
<td>60</td>
<td>66.67</td>
</tr>
<tr>
<td>3. Bidder</td>
<td>25 / 25 / 20 / 10</td>
<td>80</td>
<td>88.89</td>
</tr>
<tr>
<td>4. Bidder</td>
<td>10 / 10 / 10 / 10</td>
<td>40</td>
<td>44.45</td>
</tr>
<tr>
<td>5. Bidder</td>
<td>20 / 20 / 20 / 10</td>
<td>70</td>
<td>77.78</td>
</tr>
<tr>
<td>6. Bidder</td>
<td>10 / 10 / 10 / 10</td>
<td>40</td>
<td>44.45</td>
</tr>
<tr>
<td>7. Bidder</td>
<td>10 / 10 / 10 / 10</td>
<td>40</td>
<td>44.45</td>
</tr>
<tr>
<td>8. Bidder</td>
<td>25 / 25 / 20 / 20</td>
<td>90 (max)</td>
<td>100</td>
</tr>
</tbody>
</table>

1. Bidder’s Normalized Technical Competence Score = \( \frac{70 \times 100}{90} = 77.78 \)

2. Bidder’s Normalized Technical Competence Score = \( \frac{60 \times 100}{90} = 66.67 \)

3. Bidder’s Normalized Technical Competence Score = \( \frac{80 \times 100}{90} = 88.89 \)

4. Bidder’s Normalized Technical Competence Score = \( \frac{40 \times 100}{90} = 44.45 \)

5. Bidder’s Normalized Technical Competence Score = \( \frac{70 \times 100}{90} = 77.78 \)

6. Bidder’s Normalized Technical Competence Score = \( \frac{40 \times 100}{90} = 44.45 \)

7. Bidder’s Normalized Technical Competence Score = \( \frac{40 \times 100}{90} = 44.45 \)

8. Bidder’s Normalized Technical Competence Score = \( \frac{90 \times 100}{90} = 100 \)
### Service Quality Scores:

<table>
<thead>
<tr>
<th>Bidder</th>
<th>SQ1 / SQ2</th>
<th>Total Score</th>
<th>Normalized Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bidder</td>
<td>50 / 10</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>2. Bidder</td>
<td>50 / 10</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>3. Bidder</td>
<td>50 / 10</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>4. Bidder</td>
<td>50 / 10</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>5. Bidder</td>
<td>50 / 30</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>6. Bidder</td>
<td>50 / 10</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>7. Bidder</td>
<td>50 / 20</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>8. Bidder</td>
<td>50 / 50</td>
<td>100 (max)</td>
<td>100 points</td>
</tr>
</tbody>
</table>

1. Bidder's Normalized Service Quality Score = \( \frac{60 \times 100}{100} = 60 \)

2. Bidder's Normalized Service Quality Score = \( \frac{60 \times 100}{100} = 60 \)

3. Bidder's Normalized Service Quality Score = \( \frac{60 \times 100}{100} = 60 \)

4. Bidder's Normalized Service Quality Score = \( \frac{60 \times 100}{100} = 60 \)

5. Bidder's Normalized Service Quality Score = \( \frac{80 \times 100}{100} = 80 \)

6. Bidder's Normalized Service Quality Score = \( \frac{60 \times 100}{100} = 60 \)

7. Bidder's Normalized Service Quality Score = \( \frac{70 \times 100}{100} = 70 \)

8. Bidder's Normalized Service Quality Score = \( \frac{100 \times 100}{100} = 100 \)

### Financial Capacity Scores:

<table>
<thead>
<tr>
<th>Bidder</th>
<th>FC1</th>
<th>Total Score</th>
<th>Normalized Puan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bidder</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>2. Bidder</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>3. Bidder</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>4. Bidder</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>5. Bidder</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>
**Table: FC1 - Total Score - Normalized Puan**

<table>
<thead>
<tr>
<th>Bidder</th>
<th>FC1</th>
<th>Total Score</th>
<th>Normalized Puan</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.Bidder</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>7.Bidder</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>8.Bidder</td>
<td>50</td>
<td>50 (max)</td>
<td>100 points</td>
</tr>
</tbody>
</table>

1. Bidder’s Normalized Financial Capacity Score = \( \frac{25 \times 100}{50} = 50 \)
2. Bidder’s Normalized Financial Capacity Score = \( \frac{25 \times 100}{50} = 50 \)
3. Bidder’s Normalized Financial Capacity Score = \( \frac{25 \times 100}{50} = 50 \)
4. Bidder’s Normalized Financial Capacity Score = \( \frac{25 \times 100}{50} = 50 \)
5. Bidder’s Normalized Financial Capacity Score = \( \frac{50 \times 100}{50} = 100 \)
6. Bidder’s Normalized Financial Capacity Score = \( \frac{25 \times 100}{50} = 50 \)
7. Bidder’s Normalized Financial Capacity Score = \( \frac{25 \times 100}{50} = 50 \)
8. Bidder’s Normalized Financial Capacity Score = \( \frac{50 \times 100}{50} = 100 \)

**Final Total Scores:**

1. Bidder 70 * 56.78 + 2.4 * 50 + 5.7 * 60 + 21.9 * 77.78 = 6139.98
2. Bidder 70 * 89.57 + 2.4 * 50 + 5.7 * 60 + 21.9 * 66.67 = 8191.97
3. Bidder 70 * 91.56 + 2.4 * 50 + 5.7 * 60 + 21.9 * 88.89 = **8817.89**
4. Bidder 70 * 92.10 + 2.4 * 50 + 5.7 * 60 + 21.9 * 44.45 = 7882.45
5. Bidder 70 * 81.86 + 2.4 * 100 + 5.7 * 80 + 21.9 * 77.78 = 7285.65
6. Bidder 70 * 87.04 + 2.4 * 50 + 5.7 * 60 + 21.9 * 44.45 = 7528.26
7. Bidder 70 * 100 + 2.4 * 50 + 5.7 * 70 + 21.9 * 44.45 = 8492.46
8. Bidder 70 * 99.07 + 2.4 * 100 + 5.7 * 100 + 21.9 * 100 = **9934.90**

When the lowest price is evaluated as the most economically advantageous bid, the first firm that should be contracted with should be the seventh bidder while the second should be the eighth bidder. If the most economically advantageous offer is to be determined only on the basis of price or also with the non-price factors, the first firm to be contracted should be the
eighth bidder and the second should be the third bidder. (See Table 2.11) The tenderer is the third company 3. Thus, the tender process will be completed taking into account factors other than price, such as cost efficiency, effectiveness, quality and technical value.

Table 2.11 Tender commission decision table - Open Tender

<table>
<thead>
<tr>
<th>Tender Commission Table</th>
<th>The Lowest Price</th>
<th>Non-Price Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) – 7th BIDDER</td>
<td>(1) – 8th BIDDER</td>
</tr>
<tr>
<td></td>
<td>(2) – 8th BIDDER</td>
<td>(2) – 3rd BIDDER</td>
</tr>
</tbody>
</table>

Conclusion And Recommendations

In order to transform public expenditure into a convenient and efficient system, it is essential to apply the lowest price in terms of the most economically advantageous bid for service procurement tender. However, the most appropriate price can be determined by adding the non-price elements to the evaluation. In this case, the economically most advantageous bid is determined either considering only the price basis or the price together with the non-price elements such as operation and maintenance cost, cost efficiency, effectiveness, quality and technical value. This will lead to a solution-oriented procurement approach that will incorporate elements that will maximize public utility of Public Health Investment Projects.

In the study, non-price elements were determined for the pre-construction projects before the construction of the General Directorate of Health Investments. The weights of importance of the three basic criteria are determined by fuzzy AHP. Weight coefficients are determined in seven subcriteria of the three non-price components to be considered in determining the most advantageous bid in terms of economy, and they are defined in detail so that the distribution of each non-price component in the total weight ratio can be indicated in the administrative condition. Due to the complexity of the scoring of the improved price factors, a program in Microsoft Visual Studio NET (C#.NET) language has been prepared and used by the administration in order to avoid errors in the application of non-price elements in commission decisions.

As a result of the study, in addition to the lowest price in the health insurance contracts; the efficiency, quality, financial capacity and technical value of the contractors are also taken into consideration during the tender process. The contractor’s due diligence is quantitatively included in the procurement process. The minimization of time extension due to the project and increased workload activities will also enable the minimization of health investment costs and enable the health investment activities to be brought in the economy. Systematic suggestions for using the Non-Price Feature more effectively and efficiently in future studies are also given below.
1. In the coordination of the Public Procurement Authority, an additional area can be established in the jointly used database (EPPP-Electronic Public Procurement Platform) in the scope of investment programs of the ministries, as there will be information about the contractors and the projects connected to the contract. Thus, thanks to the database, the related institutions will be able to predict whether contractors will be able to make projects on time and in good quality by following the number of contracts they have made with the ministries during the fiscal year.

2. Sub-forms can be added under the "Project" tab of the "Investment Tracking System" in order to check whether the bidders have exceeded the deadlines according to the work schedule specified in the contracts they have made with the General Directorate of Health Investments. In these sub-forms, (delayed / suspended) time information will be archived and the contractors’ careful responsibility for the projects will be taken into account. Delayed / suspended time information can be specified as a separate parameter and included in the work as a non-price sub-component.
DETERMINATION AND WEIGHTING OF NON-PRICE FACTORS USING FUZZY ANALYTIC HIERARCHY PROCESS IN THE CONTEXT OF COST - EFFECTIVENESS, EFFICIENCY AND ECONOMY IN HEALTH INVESTMENT PROJECTS SERVICE PROCUREMENT DECISIONS

Orhan PARILDAR, Çağdaş AKYUREK, Sukru Anil TOYGAR

References


PART II
MACROECONOMICS
The Emerging Process of Monetarism

The monetarist view, basically related to explaining a correlation between the amount of money and the prices, is identified with Milton Friedman who came up with a new interpretation of the theory along with the Classical and Keynesian teachings to cope with the economic problems. The theory was initially interpreted by Jean Bodin (1530-1596) regarding different conditions and sanctions in the mercantilist era, mainly realized by diminishing the precious metal content in coins during the 16th century in France. The purpose of that application was to increase the money supply in consideration of the scarce gold and silver mining production with adverse impacts on the multiplying trade volume. From a different point of view, it provided the king with the opportunity to finance his debts with lesser amounts of precious metals. In Bodin’s view, the price increases were based on different reasons. Among these reasons consisted of the increase in monopoly, the preference of high-priced products especially by the aristocrats, and the inflow of precious metals toward France through looting (Kaldor, 1985).

The development of monetary theory from the mercantilist era to the 1970s and its theoretical criticism had brought forth a new economic trend heavily dominated by monetary theory. Although that new trend was first coined by Karl Brunner in 1968 as “Monetarism” which had been a crucial economic thought throughout the second half of the twentieth century, Milton Friedman and his teachings are considered as the founder of Monetarism (Savaş, 2000: 870; Brunner, 1968: 9-24). The monetary developments that led to the introduction of Monetarism up until the 1970s are formed by different philosophers involving different economic outcomes and comparisons. For instance, Tobin argued that any change in the amount of money could not change the economy alone, in other words, it could not be regarded as an indicator that could reflect the situation in the economy. It should be noted that the changes in the amount of money are not considered to be insignificant even though they do not have the power to direct the economy alone. Thus, even though the change in the amount of money is important, there is considerable uncertainty regarding when and to what extent its impact on

* Assist. Prof. Nigde Omer Halisdemir University
the economy might emerge (Paya, 2007: 312-313). Different views and developments pertaining to the monetary theory are shown in the table below.

**Table 1: The Views on Monetary Theory**

<table>
<thead>
<tr>
<th>Economic Trend, Theorem, Phenomenon</th>
<th>Overview of Monetary Theory and its Criticism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classic School</td>
<td>Money is neutral, and money is perceived as a veil covering economic relations. Only the intermediary function of money in economic transactions is considered. Based on the exchange rate equation, the velocity of circulation of money is constant in the short-run.</td>
</tr>
<tr>
<td>Neo-Classical Synthesis</td>
<td>The development of monetary theory seems to be limited. In other words, synthesizing views support Keynesian teachings, while also retaining traditional teachings. In this case, there is an incompatibility. In other words, the neoclassical synthesis indicates the existence of situations in which the monetary theory put forward, while the development of the monetary theory is limited. The equation of exchange approach (Fisher’s quantity theory) highlights the money supply in explaining the value of money.</td>
</tr>
<tr>
<td>Mercantilist School</td>
<td>Money is the source of wealth. Countries gain wealth through the accumulation of gold and silver as well as individuals gain wealth by saving money.</td>
</tr>
<tr>
<td>Walrasian General Equilibrium</td>
<td>The functions of money are limited to the medium of exchange.</td>
</tr>
<tr>
<td>New Classical School</td>
<td>According to the assumptions of Rational Expectations, the employees are expected to figure out the consequences of the relationship between the money supply and price levels.</td>
</tr>
<tr>
<td>Keynesian School</td>
<td>Money has several different functions. The function of money as a store of value does not have to coincide with the purchase and sale decisions. The velocity of circulation of money is unstable. The equation of exchange is not accepted.</td>
</tr>
<tr>
<td>Real Business Cycle Theory</td>
<td>Money is neutral either in the long- or the short-run. On the other hand, the impact of the money supply on the economy is taken into consideration.</td>
</tr>
<tr>
<td>Supply-Side Economics</td>
<td>It is claimed that inflation is realized in case of the money supply determined in excess of the production growth.</td>
</tr>
<tr>
<td>Radcliffe Report</td>
<td>Radcliffe Report (1958) stated that the velocity of circulation of money was definitely ambiguous. According to the Report, a change in the money supply would affect the financing of government debt by only changing the interest rates.</td>
</tr>
<tr>
<td>Tobin</td>
<td>Tobin improved the Keynesian theory of demand for money in compliance with the Keynesian view that asserts the sensitivity of demand for money to interest rates. The risk, as the most important factor, is considered.</td>
</tr>
<tr>
<td>Chicago School</td>
<td>Inclusion of time (term) deposits, as well as demand deposits, into the definition of money supply.</td>
</tr>
<tr>
<td>Gurley-Shaw Approach</td>
<td>The inclusion of all assets which are considered as liquid by the households into the definition of money.</td>
</tr>
</tbody>
</table>

As seen in the table above, economists and the policy-makers have developed many different applications and theories regarding the monetary theory over which they have disputed for so long. Upon examining the development of theories, the classical quantity theory of money following the barter economy suggested that any change in the amount of money would lead to changes in the general level of direct prices and maintained its validity in economics until almost the year 1929, and even the theory is used in many monetary analyses. There are two versions of the classical quantity theory developed by Irvin Fisher who provided a mathematical interpretation of the theory. The first version developed by Fisher in 1911 is called “Pure Classical Quantity Theory,” while the Cambridge Approach developed by A. Cecil Pigou in 1917 is called the second version (Kılıç, 2006: 192). These two theories constitute the basis of the modern quantity theory. Here, it should be taken into consideration that there are opinions that differentiate the causes of demand for money as well as exchange purpose, while traditional money theories tend to view the reason for those who hold money as an exchange. For example, in Keynes’ Liquidity Preference Theory, the storage of value function of money is also taken into account (Paya, 2013: 74). Another issue that is discussed apart from the functions of money is the existence of the money. Leijonhufvud argued that an economy in which money is used would lead to underemployment problems and that money would eventually result in market failure which would cause employment problems. He attributed that conclusion to the lack of effectiveness of Say’s law in an economy where money is used (Leijonhufvud, 1969). Again, according to Clower, the problem of underemployment arises from the money (Clower, 1967).

General Framework And Empirical Findings About The Monetarist View

Monetarism, or the monetarist view as another expression, assumes the nature of a concept further to the above mentioned monetary theory adventure which had been used since the 1960s in the USA since the late 1970s in Europe and since after 1980 in Turkey (Paya, 2007: 322). Many economists, such as Philip Cagan, Richard Selden, George Stigler, Karl Brunner, and Philip Cagan led by Milton Friedman, are called monetarists since they have attributed stagflation problem that could not be solved to excess supply of money, even though they have questioned the necessity of government intervention in case of an economic crisis. The existence of money and its impacts on the economy have been brought back on the agenda by the monetarists. In fact, there are some discourses that support this situation (Öztürk, 2017: 187; Parasız, 1996).

“Milton Friedman was once quoted as saying, ‘We are all Keynesians, now,’ and I am quite prepared to reciprocate that ‘we are all Monetarists’ - if by monetarism is meant assigning to the stock of money a major role in determining output and prices.” (F. Modigliani)
“Nowadays no one speaks of the price level, exchange rates or interest rates unless mentioning the quantity of money. In this sense, we are all Monetarists” (Robert Lucas)

The chapter entitled “Quantity Theory of Money- A Restatement” in Milton Friedman’s book named Studies in Quantity Theory of Money which was published in 1956 set out the basic principles of Monetarism. Nonetheless, the trend was first coined by Karl Brunner’s article named The Role of Money and Monetary Policy published in 1968 (Küçükkalay, 2011: 407). According to monetarists, an inappropriate monetary policy practice leads to instability in the economy. Especially due to the Great Depression experienced in 1929, there had been several monetary policy malpractices implemented by policy-makers. Other basic assumptions of the monetarists are as follows (Bilgili, 2012: 199);

• According to Friedman, the most important monetary factor in the economy is the amount of money in circulation.
• Inflation is always and everywhere a monetary phenomenon. Therefore, monetarists believe that the increase in money supply is the main reason for inflation.
• Whether or not public expenditures are inflationary depends on the financing of public expenditure.
• According to Monetarists, money is a luxury good.
• Money supply is an exogenous variable.
• The emergence of the crisis in 1973 is attributed to the failure of policy implementations by the traditional Keynesians.

According to Friedman, demand for money depends on three basic factors: the amount of assets acquired by economic units, the efficiency of the assets, and the preferences of those holding money. Similarly, the functions of the money are also differentiated. The following are the alternative forms of holding wealth and the conclusions drawn by modern quantity theorists (Parasız, 2009: 421-422).
Although there are some empirical findings on which the Monetarist view is based in a theoretical sense, Friedman lists those findings as follows (Friedman, 1991; Paya, 2007: 324-325).

- Nominal national income and growth rates of money are, not perfectly, but strongly linked.
- The change in the amount of money requires a probable period that is subject to change in order to affect income in different situations.
- An average of 6 - 9 months is required for the change in the amount of money to affect income.
- Any change in monetary expansion does not affect prices initially, but the first effects occur at the level of production.
• The change in the general level of prices occurs after 12-18 months following the increase in money supply.
• The implemented monetary policies can cause a change in the production level within the short-run (approximately 5-10 years). In the long-run, however, production is influenced by different factors such as creativity, diligence, and industry structure as opposed to monetary changes.
• Inflation is always a monetary phenomenon at all times and everywhere, but only when the rate of increase in money supply is higher than of production.
• The reasons for the increase in money supply are numerous (discovery of new gold mines, funding of public expenditures, funding of private sector expenditures).
• Public expenditures may or may not be inflationary. The inflationary effect may occur if public expenditure is realized with money printing or bank money.

The empirical findings reinforce the differences of the Monetarist view in comparison with the Classical and Keynesian Schools. In this context, emphasizing the aspects which separates it from other schools can make it easier to comprehend the Monetarist view. The main factor responsible for those three schools are separated from each other is the monetary policy to be implemented in case of an employment problem in the economy which results in different impacts. The three aspects upon which they agree are a reduction of unemployment in the economy as much as possible, the steady increase in national income and the elimination of the problem of inflation. While the Classical were in favor of voluntary unemployment and full employment regarding unemployment, an economy in equilibrium could be underemployed according to Keynes. Friedman argued that activist monetary policies would increase national income and employment in the first place, even though concentrated on the natural rate of unemployment (Küçükaksoy, 2011: 418).

When compared with the other economic schools, the Monetarist view seems to differ from Keynesian school especially in the interpretations of the economic crisis of 1929. Keynes explained the cause of the economic crisis as the lack of demand; Friedman described the crisis as a monetary phenomenon and argued that the most effective way to get out of the crisis was monetary policy. As opposed to Friedman, who was against the government intervention and was in favor of the liberal economy same as the Classicals, Keynes considered the government intervention in economic policies as necessary. Friedman pointed out the insufficiency of the Keynesian solutions against crises and introduced new and predominantly monetary policy-based prescriptions. Again, according to Monetarists, money supply is considered as a strategic variable determining the circumstance, whereas the national change is the cause of fluctuations in money supply according to the Keynesian thesis (Küçükaksoy, 2015: 61; Unay, 1996: 176-178).
While the Monetarist view is not accepted by some economists within a certain period except for certain comparisons, it has also been adopted as the economic policy of certain countries. For instance, Reagan from the United States, Thatcher from the Britain and Özal from Turkey applied Friedman’s views to certain economic policies. The Monetarist view especially attracted much attention from the central banks and is accepted by them besides the countries. In fact, while the fiscal policy was excluded from being an economic policy, the emphasis on the monetary policy practices became crucial. In this context, the Keynesian economic policies were excluded from being an economic policy, and the revival of the Classical economic theory was experienced. Despite all these developments, it is thought that the crisis of 2008 reduced the impact of the Monetarist school, indicating that the economic theory in question is a special theory to be applied during inflationary periods (Eğilmez, 2013: 184).

Different Monetary Theories And Findings On The Monetarist View

The following are Friedman’s certain contributions to the theory of economics particularly within the framework of the Monetarist view (Yay, 2001: 202);

- Revision of the Quantity Theory from a different point of view
- Permanent Income Hypothesis
- Studies related to Velocity of Circulation of Money and Demand for Money
- The hypothesis of the Natural Unemployment Rate, interpretation of inflation/unemployment
- The monetary framework of nominal income
- Adaptive Expectations Theory
- Monetary Transmission Mechanism

The Modern Quantity Theory

The Modern Quantity Theory, which was developed by Milton Friedman in 1956 on the basis of Cambridge tradition, suggests that the general theory of money claims should be regarded as a special application, and in this context, money is regarded as a durable good (Keyder, 2008: 354). In Friedman’s book entitled “The Studies on the Quantity Theory of Money,” the following views on demand for money are introduced (Kılıç, 2006: 194).

- The necessity of a new theory related to the velocity of circulation of money.
- The necessity of examining the velocity of circulation of money within demand theory.
- The necessity of applying the general price theory to demand for money.
- The necessity of re-interpretation of demand for money by re-evaluating the existing data.
MONETARIST MACROECONOMIC THEORY IN THE HISTORY OF ECONOMIC THOUGHT: MONETARISM

Ayşe ERGİN UNAL

- Money has a high degree of liquidity.
- Money is subject to the law of diminishing marginal utility.
- The total level of money holding in the economy indicates the highest level of welfare.
- The opportunity cost of holding money equals the rate of return on other economic assets.

By considering the assumptions above, the Monetarists have developed the modern quantity theorem by revising the Classical Quantity Theory. Modern Quantity Theory results in a direct relationship between the money supply and the general level of prices perceive the money supply fluctuations as the main reasons for any instability in the economy. Again, inappropriate and false monetary policy practices are seen as the cause of the Great Depression that took place in 1929. According to the Monetarist view, the decrease in the money supply may lead to stagnation, while excessive money supply leads to inflation. The inflation is still fueled by the purchase of the Treasury bills that are offered for the financing of budget deficits by the Central Bank or the provision of financing through the printing of money. This situation, which is referred to as debt monetization, leads to an economic problem (Öztürk, 2017: 190).

Monetarist economists interpret the quantity theory differently. The quantity theory is expressed as $MV = PY$. Suppose that the velocity of circulation of money ($V$) is 5, and the money supply is 60 TL. Thus, the total sum of GNP becomes 300 TL. If the money supply goes up to 100 TL, the nominal GDP should rise to 500 TL. The increase in the money supply leads to an increase in real production ($Y$) if it occurs in a period when the unemployment rate is high. On the other hand, if the economy is at full employment level, the increase in money supply would only increase the overall level of prices. If the economy is at full employment level, only the prices react to the increase in money supply (Sekmen, 2012: 63).

Friedman-Schwartz Thesis – Debate on the Lagged Effect

Monetarist quantity theory, unlike other quantity theories, takes the lags within the process of the emergence of policy effects into account. Even though these changes have already attracted Fisher’s attention, they have not included them in the studies on economic policy. Friedman-Schwartz research studies examined the monetary policy’s lagged effects and the relationship between money supply and national income. According to the results of the research, the peaks in the rate of change in the money supply precede peaks in the national income by almost 16 months. Likewise, troughs in the rate of change in the money supply precede troughs in the national income by approximately 12 months (Savaş, 2000: 882-883).

---

Anderson-Jordan Thesis

One of the studies involved in the monetary lag length and variability belongs to L.C. Anderson and J.L. Jordan, two economists of the Federal Reserve Bank of St-Louis. According to their research, almost 80 percent of the main effect of the monetary policy appears within the first three quarters (Savaş, 2000: 884). Schwartz-Friedman Thesis and Anderson-Jordan Thesis, which are related to lags in the Modern Quantity theory, have been exposed to some criticisms but have been included in the literature due to the importance given to lags.

Permanent Income Hypothesis

According to the permanent income hypothesis, it is known that total wealth does not occur within a short time and it is less affected by the real business cycles. Friedman defined consumption as a function of the permanent income within the context of the Monetarist view. In that case, any shock that would disrupt the market equilibrium could not cause the multiplier effect that would lead to an economy in total disequilibrium. The reason for this is that consumption is considered as a function of permanent income as mentioned before. This situation is explained by the following equation (Hayashi, 1982).

\[ C_p = kY_p \]

Here; \( C_p \), \( Y_p \), and \( k \) denote continuous consumption, permanent income, and the share of continuous consumption in permanent income, respectively.

Transmission Mechanism

In the Monetarist approach, money is perceived as different from, and more important than, other financial assets. In this respect, monetary financial intermediaries which produce money are different from other intermediary institutions. The privileged status of the money is related to the changes in the relative prices and the harmonization processes caused by them. The change in the amount of money changes the price and the return of the real financial assets, and in this process, production is induced by the price change. In short, money is not only a matter of monitoring changes in interest rates as opposed to Keynesians; however, it also plays a role in the realization of monetary change in the real sector (Paya, 2007: 330). In the Orthodox Keynesian model, monetary transmission is explained by the relationship between investment and interest magnitudes, while the Monetarist view concluded that the money was influenced via different channels in a series of empirical studies conducted over the period 1950-1960. Such channels are as follows (Yalta, 2011: 140-143):

Traditional Interest Channel: With money supply increase, interest rates decrease, investments increase, and total output increases.
Exchange Rate Channel: With the increase of the money supply, interest rates decrease, and capital outflow occurs in the country. In this case, the national currency depreciates, exports increase, total output increases.

Stock Prices Channel: With the increase in the money supply, the households buy stocks with some of their savings, and in this case, the stock prices increase with increasing stock demand. On the other hand, investments and total output increase.

Expenditure on Durable Consumer Goods Channels: The interest rates that would decline when the purchase of durable consumer goods are thought to be mainly financed via borrowing would reduce the cost of borrowing. In this case, expenditure on durable consumer goods increases and thus, the total expenditure increases.

Wealth Channel: The increase in the money supply would increase the stock price, the wealth would increase and total output increases.

Liquidity Channel: The stock price rises along with the increase in money supply, increasing the value of the financial assets and in this case, the financial problem is reduced, and the consumption is increased and the total output increases.

Bank Loans Channel: The expansionary monetary policy allows banks to give more loans by increasing their bank reserves. Increased loans play an important role in financing investment expenditure.

Balance Sheet Channel: The rise in money supply increases stock prices and the probability of adverse selection decreases. In this case, the investment and the total output increase in accordance with the increase in the supply of loans disbursed by depository institutions.

The Natural Rate of Unemployment and Expectations Augmented Philips Curve

Stagflation concept is tried to be explained the natural rate of unemployment by the Monetarists, and Milton Friedman developed the concept of natural unemployment. The natural unemployment rate is defined as the level of unemployment that does not change the real wages at any point, the real wages in that level of unemployment generally increase reasonably and this increase depends on the labor productivity that is subject to change due to capital accumulation and technological progress (Yıldırım et al., 2012: 365).

According to Friedman, it is not possible to increase or decrease unemployment above or below the natural level with the monetary policy in the long-term. Because the Philips curve, which has a negative slope in the short-run, is parallel to the vertical axis in the long-run. Although an expansionary monetary policy to be implemented would decrease unemployment below the natural level in the short-term, the initial rate is reached in the long-run. Therefore,
in the equality of expected and actual inflations, the economy is in a stationary state, and actual unemployment is equal to the natural unemployment rate (Blanchard, 2016).

The Philips curve indicates an inverse relationship between inflation and unemployment; however, it is also an important aspect of Keynesian economics. In the 1970s, however, the co-existence of two macroeconomic problems indicated that there were some deficiencies in the Philips Curve, so at this point, Friedman attempted to revise the curve instead of completely rejecting it. In this context, Friedman and E. Phelps argued that the relationship between inflation and unemployment illustrated by the Philips curve is only valid in the short-term and that in the long-run; the Philips curve becomes perpendicular to the horizontal axis since the price increases due to adaptive expectation of the economic agents (Elliot, 2015). The long-term Philips curve is shown in Figure 2, and there is no correlation between inflation and unemployment in the long-run.

Figure 2: Monetarist Long-Run Philips Curve

Adaptive Expectations Theorem
While monetarists accept the assumption of adaptive expectations, they anticipate that future expectations can be generated with the help of past data. According to the Adaptive Expectations theorem, even though price estimations of the workers would be misleading in the short-run, this is not the case for the employer. The adaptive expectation theory and the Phillips curve are also interpreted differently. Thus, since workers cannot perceive price changes in the short-term, a trade-off between inflation and unemployment occurs, and the Phillips curve
becomes convex to the origin. Nevertheless, when the workers are aware of their misled expectation, the initial trade-off disappears in the long run, and the Phillips curve becomes perpendicular to the horizontal axis (Hommes et al., 2015).

**Figure 3: Adaptive Expectations and Phillips Curve**

The economy initially at point $A$ and it moves to point $B$ due to the effect of the decrease in real wages in the short-run through which the price increase expectation of the workers has not changed yet, and the actual price increases exceed the price increase expectations, the unemployment rate falls from the $nru$ to $u_1$ while inflation rises from $0$ to $P_0$. However, in the long-run, the workers change their expectations on price increases and tend to demand nominal wages increase in $P_0$, which is the actual price increase. As the real wages return to their initial level, the Phillips curve shifts to the right and a different short-run Phillips curve is formed according to the new price increase expectation. The economy is no longer in equilibrium at point $B$, but at point $C$, corresponding to $P_0$ inflation rate and $nru$ unemployment rate. If the government insists on lowering the unemployment rate and maintains the practice of expansionary policies, the economy’s new equilibrium shifts to point $D$ in the short-run and to point $E$ in the long-run. Therefore, the Phillips curve interpretation based on the assumption of adaptive expectations of the Monetarist view can achieve a lower unemployment rate, provided that the price increase rate be increased in the short-term. As a result, the level of employment does not change, only the general level of prices increases.

Critics of the Adaptive Expectations Theorem are categorized into three types. The first type involves estimations made by using only the past information, although individuals or firms are expected to make use of the information of the current period. Another criticism is about
the omission of the fact that the variables are affected by more than one variable. The last type of criticism is directed on the speed of adaptation of expectations. Accordingly, the change of expectations according to the actual value is rather slow compared to the Adaptive Expectations. For example, as a result of the expansionary monetary policy, inflation needs to rise first for an increase in inflation expectations (Gertchev, 2007; Tunali, 2009).
References


Industrial Policy in Brief

Industrial policy involves all actions and policies of the government concerning industry (El-Agraar, 1980, p.113). There is not a generally accepted definition of industrial policy in literature. The goals aimed to achieve and the tools used to achieve those goals determine the scope of the policy. Policy goals can be associated with investment, technological development, competition and regional development policies (İyidoğan, 2012, p.30).

Main approaches to industrial policy consist of vertical and horizontal approaches. Vertical policies are directed towards a specific field of industry or firms. It usually takes the form of government intervention by the way of subsidies or taxes (Gual & Jodar, 2006, p.5). For instance, state aid directed towards a specific sector or a firm is a type of vertical industrial policy. In contrast to the interventionist characteristics of vertical approach, horizontal approach uses measures to regulate conditions of competition and business environment where economic operations take place. An integrated model encompasses elements of both approaches (İyidoğan, 2012, p.31).

The question of which approach to take also reflects the mindset of the government. Horizontal policy approach indeed is the product of neo liberal policies which impose economies to take measures for the regulation of the business environment. It is based on the virtue of free market where government does not intervene operation of the market and levels the playing field for all (Bartlett, 2014, p.5). In this regard, competition is the complementary to industrial policy. The scope of horizontal industrial policy can be stated as environmental conditions which are common to many industrial sectors and firms. In broad terms, it can be enlarged to include macroeconomic stability, rule of law, protection of rights and removal of bureaucratic barriers (Timo, 2006, p.11).

Indicators developed by international organisations are in line with this point of view. Global Competitiveness Index developed by World Economic Forum and Doing Business by World
Bank attach great importance at business environment and environmental conditions which create “the entrepreneur” who is believed to eventually pave the way for creative, innovative and knowledge based economy. A business environment where starting and operating a business is easy offers a favourable climate for both potential entrepreneurs and incumbent firms. Backed with macroeconomic stability and protection of rights, de-bureaucratised favourable business environment encourages foreign direct investment as well.

The policy approach which confines government to ensure a conducive business environment for firms nonetheless permits certain kinds of subsidies. Support for research and development (R&D) and small and medium sized enterprises (SMEs) protection of environment and stimulus for regional development count horizontal policy measures in this regard (Türel, n.d.). Those are also subsidies compatible with the rules of the World Trade Organisation (Chang&Grabel, 2005, p.98). Due to distortive effects on competition, World Trade Organisation (WTO) prohibits subsidies directly targeting exports or imports. Subsidies of this kind are subject to countervail or challenge as illegal measures. (WTO Agreement on Subsidies and Countervailing Measures, Article 2). However some kinds of subsidies, despite their specific nature, are exempt from challenge. Those subsidies are associated with research, regional development and environmental protection purposes. (WTO Agreement on Subsidies and Countervailing Measures, Article 8: Non Actionable Subsidies)

Global Developments Affecting Industrial Policy Design

An industrial policy design and preferences for policy options can not be considered apart from global developments. The most important factors which have impact on the production and trade are globalisation and technological development. Globalisation in loose terms can be defined as the free movement of factors of production (Gökdere,2001, pp.5-6). Through international division of labour, the global production is organised as global value chains where factors of production are obtained from different countries. There have been other ages of globalisation, however this process dominated by technological development accelerated the cooperation in the fields of production and trade and exacerbated competition (Kırım, 2009, p.35).

Especially in the late 1990s the emergence of the internet and technological developments paved the way for a renewed phase in the global economy. This process is also perceived as a milestone and a beginning of a new era called fourth industrial revolution. Apparently, economic, technological and social changes are likely to occur indispensably. This reality brings about the need for competition for both firms and countries.

Criteria for competitiveness have evolved over time. Low cost, high quality and high speed have been the indicators of competition. In today’s world this process is continuing with innovativeness and creativeness. The more innovative and creative products have been attracting customer
attention (Besler & Tonus, 2011, p.194). Theories such as absolute advantage, comparative advantage and factor endowment have been postulated in terms of competitiveness of countries. Those theories have been focusing on natural resources. In today's society “currency is information”. It does not have a homeland and can be transferred easily when compared with natural resources. It makes this century more competitive (Priede & Neuert, 2015, p.691). To stay competitive, economies are forced to be creative and innovative. And latest trends attach great importance at entrepreneur and entrepreneurship. To bring about new goods and services, new ways of production, new ways of organisation, new channels of supply, new markets are defined as novelty by Schumpeter in literature. Those who champion bringing about novelties lead competition. According to a definition by Organisation for Economic Cooperation and Development, in today's world, competition refers to producing goods and services which are demanded in global markets and simultaneously raising welfare of citizens (Türker, 2009, pp.56-58).

It should be noted that the decisions of governments to liberalise economic relations or put barriers on the relations also play an important role in the way of the global economy. It also determines the direction of the world economy in the way of opening or closing. While technological advances introduce new goods and services and globalisation makes it spread around the globe, the limits of this movement are determined by governmental decisions. (Chang & Grabel, 2005, p.48). Depending on business cycles the world economy has been passing through phases of openness and closeness. Although globalisation is seen as an irreversible process, politics may extinguish the benefits of free trade.

Measures directed towards leading competition, staying competitive or not lacking behind competitors are related to industrial policy design. Recent developments which raise the share of services sector and reduces the share of industrial production led to the deindustrialisation process. Due to the bubbles in those sectors causing financial crisis of 2008, the importance of industrialisation has been well understood and put goals of industrialisation on the agenda (Aiginger, 2014, p.24).

Comparison of EU Countries and Global Actors on a Global Scale

As mentioned above, indexes developed by international organisations help to determine the rankings of competitiveness of economies. World Economic Forum (WEF) measures competitiveness taking account of the criteria concerning institutions, infrastructure, macroeconomic environment, primary education, development of markets and technological readiness. Those criteria are seen as the capacity of welfare an economy can achieve with all possibilities it has. It can be said that production possibilities in this regard means more than factors of production.

Global Competitiveness Index (GCI) covers 114 subtitles constituting 12 pillars and those 12 pillars constitute 3 main subindexes which finally form GCI. GCI evaluates economies in three
phases according to their achievements in 3 main subindexes. Basic requirements subindex refers to factor driven; efficiency enhancers to efficiency driven and innovation and sophistication factors to innovation driven economies.

Table 1. GCI Framework

<table>
<thead>
<tr>
<th>Basic requirements subindex</th>
<th>Efficiency enhancers subindex</th>
<th>Innovation and sophistication factors subindex</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Macroeconomic environment</td>
<td>7. Labour market efficiency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. Technological readiness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10. Market size</td>
<td></td>
</tr>
<tr>
<td>Key for Factor Driven Economies</td>
<td>Key for Efficiency Driven Economies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Key for Innovation Driven Economies</td>
<td></td>
</tr>
</tbody>
</table>


Table 2. The Most Competitive Countries According to GCI (2017-2018)

Switzerland 1  
USA 2  
Singapore 3  
Netherlands 4  
Germany 5  
Hong Kong 6  
Sweden 7  
UK 8  
Japan 9  
Finland 10


WEF Global Competitiveness Report 2017-2018 covers 137 countries. According to GCI the most competitive 10 countries are Switzerland, USA, Singapore, Netherlands, Germany, Hong Kong, Sweden, UK, Japan and Finland. According to the details of findings of GCI, comparison among the best performing countries reveals that Switzerland and Singapore are successful
in 3 criteria while Japan lacks in macroeconomic environment due to the long lasting deflation. Nevertheless budget balance and high savings appear to be the advantages of Japan’s economy. As 25th in basic requirements, 10th in institutions and 83rd in macroeconomic environment, USA is a unique example in this case. Although it lacks in basic requirements, it obtains its power from efficiency enhancers and innovation. Smooth functioning of factor and goods markets and innovation ecosystems prove advantages of the USA (WEF Global Competitiveness Report 2017-2018) Such advantages are the outcome of a culture in which entrepreneurship is backed historically, good examples of university-industry collaboration and a culture promoting the right to fail. (The Economist, 2009, March 12).

Among other global actors, while China ranks 27th, Korea is the 26th and India is the 40th in GCI. Common features of those countries are listed as follows: being innovative, attracting foreign direct investment and having clusters listed in the top 50 clusters in the world (WEF Global Competitiveness Report 2017-2018).

According to GCI, European Union (EU) countries are listed as follows:

Table 3. GCI Rankings of EU Countries (2017-2018)

<table>
<thead>
<tr>
<th>Country</th>
<th>Rank</th>
<th>Country</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>4</td>
<td>Malta</td>
<td>37</td>
</tr>
<tr>
<td>Germany</td>
<td>5</td>
<td>Poland</td>
<td>39</td>
</tr>
<tr>
<td>Sweden</td>
<td>7</td>
<td>Lithuania</td>
<td>41</td>
</tr>
<tr>
<td>UK</td>
<td>8</td>
<td>Portugal</td>
<td>42</td>
</tr>
<tr>
<td>Finland</td>
<td>10</td>
<td>Italy</td>
<td>43</td>
</tr>
<tr>
<td>Denmark</td>
<td>12</td>
<td>Slovenia</td>
<td>48</td>
</tr>
<tr>
<td>Austria</td>
<td>18</td>
<td>Bulgaria</td>
<td>49</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>19</td>
<td>Latvia</td>
<td>54</td>
</tr>
<tr>
<td>Belgium</td>
<td>20</td>
<td>Slovakia</td>
<td>59</td>
</tr>
<tr>
<td>France</td>
<td>22</td>
<td>Hungary</td>
<td>60</td>
</tr>
<tr>
<td>Ireland</td>
<td>24</td>
<td>Cyprus</td>
<td>64</td>
</tr>
<tr>
<td>Estonia</td>
<td>29</td>
<td>Greece</td>
<td>67</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>31</td>
<td>Romania</td>
<td>68</td>
</tr>
<tr>
<td>Spain</td>
<td>34</td>
<td>Croatia</td>
<td>74</td>
</tr>
</tbody>
</table>

Source: GCI

Five EU countries rank in the top 10 of GCI. Germany, Netherlands, UK, Sweden and Finland perform well in 3 indexes and 12 subindexes. Especially their ability to innovate and sophisticated business environment make them achieve successful results.(WEF Global Competitiveness Report 2017-2018) Those countries are also called innovation leaders in European
Innovation Scoreboard. European Innovation Scoreboard measures innovation performances of EU countries, candidate countries and global actors on a comparative basis.

According to the latest innovation scoreboard, released in June 2018, Sweden, Denmark, Finland, Netherlands, UK and Luxembourg are innovation leaders. When Austria, Germany, Belgium, Ireland, France and Slovenia are strong innovators, Czech Republic, Portugal, Estonia, Lithuania, Spain, Malta, Italy, Cyprus, Slovakia, Greece, Hungary, Latvia, Poland and Croatia remain moderate innovators. Bulgaria and Romania form the group of modest innovators. Surprisingly compared with previous reports, there is a shift between Germany and Luxembourg. While Luxembourg is listed in innovation leaders, Germany is degraded to strong innovators group. Findings of both GCI and European Innovation Scoreboard are almost overlapping except for this shift concerning Germany. But it is also indicated that the performance differences between strong innovators and innovation leaders are small (European Commission, 2018, p.18).

Differences across countries concerning economic structures are also reflected in their R&D investments. Resources allocated to R&D are an important indicator of Europe 2020 envisioning a knowledge based economy for the EU. R&D expenditure target for the EU as a share of GDP provided for in the Europe 2020 is 3%. Table 4 shows the R&D expenditure targets and performances of the EU countries. (Table 4 has been prepared according to GCI ranks of EU countries). Those countries known competitive devote more resources to R&D and specify higher targets respectively. The expenditure on R&D as a percentage of GDP for best performing countries is high. While Denmark and Germany set targets equal to 3%, Sweden and Finland’s targets are above the Europe 2020. Nevertheless they perform behind the target. The EU as a bloc consist of countries at different paces. On one hand there are countries performing close to the specified target and on the other those who can not live up to the target. The performance of the EU 28 is below the specified target of 3%. The table also shows USA, Japan and South Korea’s performances. R&D expenditure as a percentage of GDP of USA is around 2.79 (with the difference of definition), while Japan’s is above 3. South Korea’s R&D expenditure as a share of GDP is above 4 and has an increasing trend despite the fall from 2014 to 2015.
### Table 4. R&D Expenditures of EU Countries (% of GDP)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EU 28</td>
<td>3</td>
<td>1.93</td>
<td>1.93</td>
<td>1.97</td>
<td>2.01</td>
<td>2.02</td>
<td>2.03</td>
<td>2.04</td>
<td>2.03p</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2.5</td>
<td>1.69</td>
<td>1.72</td>
<td>1.9b</td>
<td>1.94b</td>
<td>1.95</td>
<td>2</td>
<td>2</td>
<td>2.03p</td>
</tr>
<tr>
<td>Germany</td>
<td>3</td>
<td>2.72</td>
<td>2.71</td>
<td>2.8</td>
<td>2.87</td>
<td>2.82</td>
<td>2.87</td>
<td>2.92</td>
<td>2.94p</td>
</tr>
<tr>
<td>Sweden</td>
<td>4</td>
<td>3.45</td>
<td>3.22e</td>
<td>3.25</td>
<td>3.28e</td>
<td>3.31e</td>
<td>3.15e</td>
<td>3.2</td>
<td>3.25p</td>
</tr>
<tr>
<td>UK</td>
<td>-</td>
<td>1.69e</td>
<td>1.67e</td>
<td>1.67b</td>
<td>1.6e</td>
<td>1.65</td>
<td>1.67e</td>
<td>1.67</td>
<td>1.69p</td>
</tr>
<tr>
<td>Finland</td>
<td>4</td>
<td>3.75</td>
<td>3.73</td>
<td>3.64</td>
<td>3.42</td>
<td>3.29</td>
<td>3.17</td>
<td>2.9</td>
<td>2.75</td>
</tr>
<tr>
<td>Denmark</td>
<td>3</td>
<td>3.06</td>
<td>2.92</td>
<td>2.94</td>
<td>2.98</td>
<td>2.97</td>
<td>2.91</td>
<td>2.96p</td>
<td>2.87p</td>
</tr>
<tr>
<td>Austria</td>
<td>3.6</td>
<td>2.6</td>
<td>2.73e</td>
<td>2.67</td>
<td>2.91e</td>
<td>2.95</td>
<td>3.07e</td>
<td>3.05</td>
<td>3.09p</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>2.3</td>
<td>1.68</td>
<td>1.5</td>
<td>1.46</td>
<td>1.27b</td>
<td>1.3</td>
<td>1.26</td>
<td>1.2</td>
<td>1.24p</td>
</tr>
<tr>
<td>Belgium</td>
<td>3</td>
<td>1.99</td>
<td>1.99</td>
<td>2.04</td>
<td>2.1</td>
<td>2.1</td>
<td>2.13</td>
<td>2.4</td>
<td>2.49p</td>
</tr>
<tr>
<td>France</td>
<td>3</td>
<td>2.21</td>
<td>2.18b</td>
<td>2.19</td>
<td>2.23</td>
<td>2.24</td>
<td>2.23</td>
<td>2.27p</td>
<td>2.25p</td>
</tr>
<tr>
<td>Ireland</td>
<td>2</td>
<td>1.59e</td>
<td>1.55e</td>
<td>1.56e</td>
<td>1.56e</td>
<td>1.56e</td>
<td>1.5</td>
<td>1.2</td>
<td>1.18e</td>
</tr>
<tr>
<td>Estonia</td>
<td>3</td>
<td>1.4</td>
<td>1.58</td>
<td>2.31</td>
<td>2.12</td>
<td>1.72</td>
<td>1.45</td>
<td>1.49</td>
<td>1.28</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1</td>
<td>1.29</td>
<td>1.34</td>
<td>1.56</td>
<td>1.8</td>
<td>1.9</td>
<td>1.97</td>
<td>1.93</td>
<td>1.68p</td>
</tr>
<tr>
<td>Spain</td>
<td>2</td>
<td>1.35</td>
<td>1.35</td>
<td>1.33</td>
<td>1.29</td>
<td>1.27</td>
<td>1.24</td>
<td>1.22</td>
<td>1.19</td>
</tr>
<tr>
<td>Malta</td>
<td>2</td>
<td>0.52</td>
<td>0.61</td>
<td>0.67</td>
<td>0.83</td>
<td>0.77</td>
<td>0.72</td>
<td>0.77</td>
<td>0.61p</td>
</tr>
<tr>
<td>Poland</td>
<td>1.7</td>
<td>0.66</td>
<td>0.72</td>
<td>0.75</td>
<td>0.88</td>
<td>0.87</td>
<td>0.94</td>
<td>1</td>
<td>0.9p</td>
</tr>
<tr>
<td>Lithuania</td>
<td>1.9</td>
<td>0.83</td>
<td>0.78</td>
<td>0.9</td>
<td>0.89</td>
<td>0.95</td>
<td>1.03</td>
<td>1.04</td>
<td>0.85</td>
</tr>
<tr>
<td>Portugal</td>
<td>2.7</td>
<td>1.58</td>
<td>1.53</td>
<td>1.46</td>
<td>1.38</td>
<td>1.33</td>
<td>1.29</td>
<td>1.24</td>
<td>1.27p</td>
</tr>
<tr>
<td>Italy</td>
<td>1.53</td>
<td>1.22</td>
<td>1.22</td>
<td>1.21</td>
<td>1.27</td>
<td>1.31</td>
<td>1.34e</td>
<td>1.34</td>
<td>1.29p</td>
</tr>
<tr>
<td>Slovenia</td>
<td>3</td>
<td>1.82</td>
<td>2.06</td>
<td>2.42b</td>
<td>2.57</td>
<td>2.58</td>
<td>2.37</td>
<td>2.2</td>
<td>2p</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1.5</td>
<td>0.49</td>
<td>0.56</td>
<td>0.53</td>
<td>0.6</td>
<td>0.63</td>
<td>0.79</td>
<td>0.96</td>
<td>0.78</td>
</tr>
<tr>
<td>Latvia</td>
<td>1.5</td>
<td>0.45</td>
<td>0.61</td>
<td>0.67</td>
<td>0.66</td>
<td>0.61</td>
<td>0.69</td>
<td>0.63</td>
<td>0.44</td>
</tr>
<tr>
<td>Slovakia</td>
<td>1.2</td>
<td>0.47</td>
<td>0.62</td>
<td>0.66</td>
<td>0.8</td>
<td>0.82</td>
<td>0.88</td>
<td>1.18</td>
<td>0.79</td>
</tr>
<tr>
<td>Hungary</td>
<td>1.8</td>
<td>1.13</td>
<td>1.14</td>
<td>1.19</td>
<td>1.26</td>
<td>1.39</td>
<td>1.35</td>
<td>1.36</td>
<td>1.21</td>
</tr>
<tr>
<td>Cyprus</td>
<td>0.5</td>
<td>0.44</td>
<td>0.45</td>
<td>0.46</td>
<td>0.44</td>
<td>0.48</td>
<td>0.51</td>
<td>0.48</td>
<td>0.5p</td>
</tr>
<tr>
<td>Greece</td>
<td>1.2</td>
<td>0.63e</td>
<td>0.6e</td>
<td>0.67</td>
<td>0.7</td>
<td>0.81</td>
<td>0.83</td>
<td>0.97</td>
<td>1.01</td>
</tr>
<tr>
<td>Romania</td>
<td>2</td>
<td>0.45</td>
<td>0.46</td>
<td>0.5b</td>
<td>0.48</td>
<td>0.39</td>
<td>0.38</td>
<td>0.49</td>
<td>0.48</td>
</tr>
<tr>
<td>Croatia</td>
<td>1.4</td>
<td>0.84</td>
<td>0.74</td>
<td>0.75</td>
<td>0.75</td>
<td>0.81</td>
<td>0.78</td>
<td>0.84</td>
<td>0.85p</td>
</tr>
<tr>
<td>USA</td>
<td>-</td>
<td>2.82d</td>
<td>2.74d</td>
<td>2.77d</td>
<td>2.7d</td>
<td>2.73d</td>
<td>2.75d</td>
<td>2.79dp</td>
<td>-</td>
</tr>
<tr>
<td>Japan</td>
<td>-</td>
<td>3.23</td>
<td>3.14</td>
<td>3.24</td>
<td>3.21</td>
<td>3.32b</td>
<td>3.4</td>
<td>3.29</td>
<td>-</td>
</tr>
<tr>
<td>South Korea</td>
<td>-</td>
<td>3.29</td>
<td>3.47</td>
<td>3.74</td>
<td>4.03</td>
<td>4.15</td>
<td>4.29</td>
<td>4.23</td>
<td>-</td>
</tr>
</tbody>
</table>


e: estimated; p: provisional; d: definition differs
Evaluation of the Industrial Policy of the EU

The EU has designed an industrial policy to raise competitiveness of the EU. Taking into consideration global developments, it can be said that the industrial policy is based on competitiveness. At the onset of the foundation of the Community in 1957, policies on competition and trade were seen sufficient to provide the transformation the Community industry needed. An industrial policy as a separate title was provided for in Maastricht Treaty dated 1993. What brought the Community to establish such a policy is the goal of closing technological gap between its competitors, Japan and USA and raising competitive power of the Community (Swann, 2000, p.295).

The industrial policy of the EU focuses on industry in general, specific sectors and businesses. Industrial policy is one of the policies which member states make arrangements and the Union takes measures to support those arrangements. The policy does not consist of binding regulations despite very few exceptions. It determines guiding principles as does the Europe 2020. Europe 2020 is the policy document concerning the future of the EU. Through Europe 2020 the EU aims at becoming smart, sustainable and inclusive economy. To clarify this motto, smart refers to an economy based on R&D, sustainable stands for being sensitive for environment and inclusive creating employment and embracing divergences (Europe 2020, p.5.).

With industrial policy, the Union aims to achieve those goals, namely, improving industrial base, improving business environment, supporting R&D and introducing technological novelties and promoting entrepreneurship (Treaty on the Functioning of the EU, Article 173).

In the heart of both Europe 2020 and Industrial Policy lie entrepreneurship. The policy is based on horizontal measures consisting of providing the most favourable environment where businesses are founded and operate smoothly. In EU terms, horizontal measures comprise rule of law, macroeconomic stability and protection of rights.

Since industrial policy has a regulatory nature, there are no specific mechanisms to achieve the aims of the policy provided for in the Treaty. Those goals are achieved through the tools of other policies such as Trade, Competition, Science and Research and Social Policies. Additionally, the EU stimulates R&D and support for SMEs. Framework programmes, research framework programmes and regional and structural funds also serve for the attainment of the industrial policy. As mentioned above, the industrial policy of the EU is based on competitiveness and an important feature of the competition policy necessitates the prohibition of state aid in order to ensure competition in the single market. In this regard, state aids are prohibited with the exception of support for R&D and SMEs and environmental protection. Those are also in line with WTO rules.
Comparison of EU countries and global actors reveals the divergences across EU economies. Although it is recommended to apply horizontal policies, this point of view brings about suspicion, whether one size fits all as asked in the EU jargon.

**Evaluation of the Industrial Policy of Turkey within the Framework of the EU-Turkey Relations**

EU is the gate of Turkey for opening to global markets. The relations between Turkey and EU can be traced back to 1960s. The most tangible outcome of the relations, the customs union was completed in 1996 and the negotiation process towards membership started in 2005. There are some milestones in Turkey’s industrialisation process and Turkey-EU relations which supplement each other. In 1980s, Turkey decided to follow the policy of opening to foreign markets and export led growth strategy. The decision to apply for the EU membership was a complementary step towards this policy.

Customs union is the only tangible achievement in the EU-Turkey Relations. Static and dynamic effects of the customs union have already emerged. Static effects of customs union are related to volume and direction of trade relations. Almost half of exports and imports take place with EU countries. However obligation to comply with trade policy of the EU and tariffs make Turkey disadvantageous towards third countries, since they do not have such an obligation to apply the same tariff. This asymmetric relationship provides third counties competitive power against Turkey (Boratav, 2012, 185). Besides, customs union includes only industrial products. The implementation over twenty years has brought about the need to revise the customs union between Turkey and the EU. As for dynamic effects, it can be said that the customs union has helped to transform Turkey’s economy. Dynamic effects are related to competitive power of an economy raising technological development, foreign direct investment and paving the way to innovativeness (Temiz, 2009, 126).

Through customs union, attracting foreign direct investments, technological improvements, cooperation between firms of Turkey and EU countries raised the share of motor vehicles in Turkey’s exports (European Commission, 2016, 30). On the other hand, Turkey still lacks behind its industrial goals in terms of high technology exports. According to Eurostat data, while the average of share of Turkey’s high technology exports was below 2% between 2009 and 2016, it has risen to 2.9 in 2017. On the other hand EU 28 average in high technology exports is around 16 to 17%. High technology products consist of products of aerospace, computers, electronics, telecommunications, pharmacy, scientific instruments, electrical machinery, chemistry, non-electrical machinery, armament (Eurostat).
Table 5. Comparison of Share of Turkey’s High Tech Exports with EU Average (% of Exports)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EU 28</td>
<td>17.1</td>
<td>16.1</td>
<td>15.4</td>
<td>15.7</td>
<td>15.3</td>
<td>15.6</td>
<td>17</td>
<td>17.9</td>
<td>17.8</td>
</tr>
<tr>
<td>Turkey</td>
<td>1.5</td>
<td>2</td>
<td>1.6</td>
<td>1.5</td>
<td>1.7</td>
<td>1.8</td>
<td>1.9</td>
<td>1.9</td>
<td>2.9</td>
</tr>
</tbody>
</table>


Turkey’s industrial policy goals have been declared as becoming the design and production bases of Afro-Eurasia in medium and high technology products. High value added, industrial production sensitive to society and environment are the key words of the industrial policy design (Turkey’s Industrial Strategy Document 2015-2018). In terms of Turkey’s competitiveness, Turkey ranks 53rd in GCI and according to European Innovation Scoreboard Turkey is in the group of Moderate Innovators. According to Eurostat data, Turkey’s gross domestic expenditure on R&D is below 1%. Those data show Turkey’s rank globally.

Table 6. R&D Expenditures of Turkey (% of GDP)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.81</td>
<td>0.8</td>
<td>0.8</td>
<td>0.83</td>
<td>0.82</td>
<td>0.86</td>
<td>0.88</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Datum of 2016 has been obtained from Turkish Statistical Institute.

The EU-Turkey relations is in the negotiation process. Negotiation process is the harmonisation of candidate country to the EU acquis. This process brings about fundamental changes to the legal infrastructure. Complying with the political criterion of the Copenhagen criteria is a must for the opening of the negotiations. By providing the rule of law, Copenhagen criteria help establishing the environment where individual rights are enforced. Establishing a business friendly environment is possible where rule of law is persistent.

As the essence of the industrial policy brings about guiding principles, Turkey, in the negotiation process has been preparing strategy documents taking those principles into account. In this regard, 5 priorities have been declared as promoting entrepreneurship, business development, integration of SMEs to international markets, improving business environment, improving the capacity of technology and innovativeness (SME Strategy and Action Plan 2007-2009). An improved business environment helps to level the playing field for businesses. Improving entrepreneurial skills of incumbent firms and attracting potential entrepreneurs are also in the heart of Turkey’s strategy.
To harmonise with the EU acquis and as an obligation to fulfil the requirements of the customs union, Turkey made laws in the fields of competition, intellectual property rights, protection of consumer rights and founded Patent Institute and Competition Authority (Morgil, 2006, p.94-95). Those were the required institutional arrangements for the operation of the customs union. Besides, EU standards and awareness on consumer protection have been viable through the customs union (Şahinöz, 2004,p. 29).

Industrial policy is a field associated with the rules of trade and competition. With the customs union, necessary requirements have been fulfilled. On the other hand, the rules of competition policy determine the tools that can be used for industrial purposes. Rules on state aid have been restricted according to the competition policy of the EU. In this regard, the scope of vertical policies have been specified to include R&D, SMEs, employment, environmental protection and regional development (Akdeve &Karagöl, 2013,,338).

As contracting parties, Turkey-EU relations do not follow a smooth path. Tardy completion of the customs union and ongoing negotiation process, deepening and enlargement processes of the EU have brought about this long lasting relationship. Now the revision of the customs union is on the agenda which is likely to transform the relationship. Despite all those flaws, complying with the acquis has made Turkey undergo its constitutional transformation which paves the way for an improved business environment.

**Conclusion**

Industrial policy is the actions of the government which stimulate industry. The two main approaches to industrial policy are vertical and horizontal industrial policy approaches. While the tools used by vertical approach are specific measures in the form of subsidies, horizontal approach is based on ensuring the most favourable business environment. The scope of this concept can be expanded to include ensuring macroeconomic stability, rule of law, protection of rights and removal of bureaucratic barriers.

Since globalisation and technological development are the main determinants of production and trade, industrial policy design can not be considered apart from global developments. Competition is the most significant element of free trade. Vertical measures are restricted in order not to distort competition. Moreover subsidies on research, SMEs and environmental protection are not contradictory to WTO rules which dominate global trade. Subsidies of this kind are also complementary to horizontal industrial policy measures.

The EU has designed an industrial policy to raise competitiveness of the EU economy. Measures directed towards this goal are horizontal policy measures. The scope of the policy is determined by competition policy which prohibits state aid. Likewise in the EU, subsidies on
research, environmental protection and SMEs are allowed in the context of Competition Policy and in line with the WTO rules on subsidies.

The industrial policy is closely connected to Europe 2020 which envisages a smart, sustainable and inclusive future for the EU. Europe 2020 sets the target of R&D expenditure to be %3 of GDP. Competitiveness rates calculated by GCI and innovativeness measured by European Innovation Scoreboard differ across countries and divergences are reflected in R&D expenditures of EU countries.

Turkey is in the negotiation process to become a member of the EU. Negotiation process requires candidate country to harmonise with EU law. Industrial policy is associated with other policies such as trade and competition. Having completed customs union, Turkey has already adopted the trade regime of the EU. Almost half of exports and imports take place with EU countries. Customs union has had some dynamic effects on Turkey’s economy in the field of technological improvements. Harmonisation with customs union has required changes in the legal infrastructure of Turkey.

Turkey is among modest innovators according to European Innovation Scoreboard and ranks 53rd in GCI. In addition to this R&D expenditure is below %1 of GDP. When Turkey’s industrial targets are taken into account Turkey needs to design an industrial policy based on R&D. Complying with the EU acquis in the field of industry requires taking horizontal approach. The tools which can be used for industrial purposes are limited in scope. The framework has been limited by competition policy. Ensuring a conducive business environment and stimulus for R&D, SMEs and environmental protection are the components of the industrial policy in line with the EU acquis.
References


Introduction

Macroeconomic policy is related with the functioning of the economy. In board terms, the aim of the macroeconomic policy is to ensure a stable economic process, which assists in increasing a strong and sustainable growth. Stabilization policies are economic policies being implemented especially when emerging major economic problems. Economic policies as expansionary and contractionary depending on the process in economic cycle or the point on short-term Phillips curve are most of the times formed under the direction of political decision-making process. While the choice of economic policies in the electoral periods affects the results of the election, the stabilization policies to serious economic problems are also influenced by the political system. Therefore, as well as the macroeconomic policies determined by the electoral cycle, the stabilization policies arising from economic requirement also fail for political causes. When the impact of political grounds in political economy literature on macroeconomic policies and stabilization policies are handled separately, it shall be possible to mention from two different types of political cycle and to better understand political processes in the literature.

Stabilization policies which are applied to struggle macroeconomic problems or economic crises arisen from excessive fluctuations in the economic cycle is a complex issue even when they are handled only with economic grounds and technical analysis. It is almost impossible to execute a stabilization policy by failing to know the reason and/or reasons of each economic issue. The important thing is to be able to detect the source of the problem and to put correct measures, which shall remove the same, into operation. It has been seen many times in the economic history that the stabilization policies being put into operation by failing to conduct researches, which shall determine the source of an economic problem, have worsened the situation.\(^1\) A dual separation is used while defining stabilization policies in literature. While

---

\(^*\) This study is the expanded and reviewed version of the study called “Political Reasons of Delays in Stabilization Policies” being submitted as abstract manifesto at the 3rd International Political, Economic and Social Studies being organized in Ankara between November 9-11, 2017.

\(^{**}\) Assistant Professor, Ahi Evran University, Faculty of Economic and Administrative Sciences, Department of Economy, 0555544077, halekirmizioglu@hotmail.com

\(^1\) Tight monetary and loose fiscal policies being used to solve the stagflation arisen in 1970s have not been useful since they have not been directed to the cause of the problem. Inordinate implementation of fiscal liberation in many countries along with structural adjustment programs in 1980s has caused such countries to experience crisis in 2000s.
one of these is called as Orthodox stabilization policies, the other one is stated as Heterodox policies. Heterodox policies are identified with the incomes policy, while the first thing that comes to mind under Orthodox policies are fiscal and monetary policy. Heterodox policies have particularly been presented to solve stagflation being a micro-based macro problem occurred in the 1970s. For, two familiar economic problems, which are regarded as there is no possibility for them to come out simultaneously due to events in 1970s and especially shocks in oil prices. Along with both increase in general level of prices and unemployment seen, economic policies used before for such problems have been activated however, no success could be achieved. Therefore, even though problems are familiar, the need to implement stabilization policies towards their reasons has been seen once more and it has brought up new suggestions of economic policy to be made. A stabilization policy may contain measures regarding fiscal, monetary and incomes policies together depending on the problem. There is one policy in economy literature being primarily suggested and stated that the chance of success is high for each problem. For instance, while monetary policy is recommended as a rapid and good result bringing policy for price stability, it is generally accepted that fiscal policy may give more reliable and permanent results for a sustainable growth and employment. Despite the fact there are conventional approaches regarding which policy would be applied for which economic problem, it is not as easy as to achieve success in solving problems. Above all, even detecting the problem being arisen is solely a difficulty. It is not clear to what size and for how long the economic policy which are recommended for the solution of the economic problem should be applied. There are constraints, which shall be encountered within the process of implementation of the policy even after policy decision-making process has been completed. The fiscal policy depends on a legal process may delay the implementation of the policy. Another difficulty on the implementation of such policies arises from the fact that the actors of the same are different. While monetary policy is implemented by a central bank, a fiscal policy is conducted through government on behalf of the state. In this case, the implementation of two policies at the same time and in a manner to support each other may be realized through a strong coordination between institutions. In general, it is very difficult to ensure such coordination. Also, it is disputed that a central bank acts as an independent authority. Especially the fact that the central banks’ independence in developed countries, which have a democratic system, has been achieved may be interpreted monetary authority shall not face political pressure, may implement an independent policy towards price stability and the possibility of coordination shall strengthen. In countries where independency could not be ensured, both macroeconomic policies may become open to political abuse since they shall be under the custody of politics.

Stabilization policies that should be implemented against economic problems are subject to decisions of policymakers. Accordingly, while solving economic problems in the economy is a deed on its own for the economists, the situation becomes more complex when the behaviors
and anxieties of policymakers are involved. Despite the fact that conventional acceptances on the unsuccessfulness of stabilization policies have, for long years, been explained with the irrational behaviors of politicians and the fact that they fail to have sufficient expertise, the relationship between economics and politics should require deeper analysis. The relationship between economics and political science is a mutual relation. While the events happening in the political mechanism affect economic processes and outcomes, the situation and events in the economy have also strong effects on political consequences. The true name of the discipline, which we call as economics, is the political economy and any problem and/or outcomes in the field of economics may not be understood by failing to question political and social dynamics behind them. The aims and behaviors of each political actor, who are involved in the process, during the design of a macroeconomic policy should be seen as important factors. The concept of the political business cycle being one of the broadest issues in political economy literature may be defined as the manipulation of electoral results by incumbents due to coming elections in its simplest form. In this case, many elements such as the electoral system in the country, political regime type, structure of parties, and ideological nature of governments are related with this concept. In other words, we may mention about the very existence of a political fluctuation which uses economic fluctuation to influence the thoughts of voters. This literature is mostly focused on the inflation. In fact, the stabilization policies of countries may be implemented towards unemployment, growth, foreign trade or balance of payments imbalances not only towards inflation. The literature, which focuses on this stream due to contracting of stabilization for solving inflation and heavy burdens they shall cause on the voter, ignores the subject that how the benefits, the expansionary policies in case of unemployment shall create, would be distributed. Researches in the literature seem to examine only inflation, which is caused by the budget deficit. Why does the political economy of employment, which requires redistribution of possible benefits to be dealt with, fail to exist despite the fact that the political economy of inflation has been examined? Is one of these two economic problems, which are related with cyclical fluctuation or short-term Phillips curve, more important than one other?

Political cycle in political economy studies is most often associated with political motivations and the behavior of political actors. Political causes affecting economic policies have been investigated in studies based on two basic political incentives. However, in the literature where many findings are complex, the effects of the election periods on the economic policies and the negative impacts of the political system characteristics on the stabilization policies are mixed. Therefore, the primary aim of this study has been to discover the difference between the two titles in wide and complex political economy literature. The study has been handled under three titles. The origins of the political business cycle have been analyzed under the first section. For, while the political economy is reduced to economics, dealing with behaviors of the administrative and executive units of the state have been left
to the discipline of public finance. What is the basis of the literature under which the reasons and consequences of economic policies are analyzed with modeling based on rational expectation in 1980s? Two mainstream theories on which political cycle is based and developments arisen in such theories in time have been provided under the second section. This section actually explains the political economy of macroeconomic policies. The tendency of economic policies based on the electoral cycle has been provided. Finally, in the third section, the political causes for the delaying of the stabilization policies applied to combat inflation are explained by findings in empirical researches. In summary, political, institutional and social infrastructure, which constitutes an obstacle before economic reforms being recommended for economic problems have been investigated.

1- The Origins of Political Business Cycle and Political Economy from Economic Perspective

The welfare economics, which has started with search of efficiency in economic system may be considered as the godfather of today’s new political economics. The effort to create tools to increase individual and collective welfare is the basic problem of welfare economics. In fact, the welfare economics hitting the road for the purpose of reaching optimality with competitive markets has accepted the state as one of the main actors as result of market failure and opened the way for public choices theory, which tries to understand functioning dynamics of the public economy. The foundations of this theory being attributed to theoreticians like Buchanan and Tullock today, extend to Italian School2 of Public Finance in the 19th century. Accordingly, subjects such as how sources in economy shall be divided amongst social choices and individual choices; how the burden, which shall come out depending on decision on the production of public goods, shall be shared; how the benefit and damage of externality shall be indigenized has created an obligation to closely examine the motivations of both policymakers and voters, who participate to such political decisions. While the decisions of governments that are on decision-making position within political system affect the utility of actors in the economy, the burdens and benefits, which shall come out during the implementation of policy, affect the utilities of voters, who are in fact economic actors, and differentiate their decisions for future elections. As the actors in the fields of economics and politics are the same, the sources of motivation of the same shall be similar. As the behaviors of economic actors are defined with utility maximization, the point is that they act with a similar motivation. However, to measure the utility and to forecast what is utility in terms of politics is closely related with social culture. There is a possibility for the actors, who prioritize their utilities as economic actors, to regard the collective benefit as a voter besides the possibility of regarding their benefits.

---

2 The school, which has been called as Italian School of Public Finance and come out at the end of 19th century has continued its efficiency in the first half of 20th century. The school pioneering the foundation of institutional economics has tried to understand the decisions taken in public economy through economic methodology.
While social benefit should exist in the function of purpose of government and bureaucracy being principal actors in the field of public economy, there exists a fact which should be accepted that this structure which has right of sovereignty on all citizens, to have a motivation like protecting and not losing its power.

The relation between politics and economics has been diverged from each other in time. While political actors and voting mechanisms, which are decision-making processes, are dealt independently from economic outcomes, economic problems have been dealt with technical analysis and this symbiotic dual structure has been tried to be analyzed separately from each other. Even though politics, economics and public finance disciplines have gone far from each other and been separately analyzed today, macroeconomic stability and many variables in macroeconomy may not be understood by failing to deal in extenso. The field known as welfare economics, focuses on defining social benefit or welfare and measuring social benefit. The theoretical framework, which comes forth under the title of public economy, comprises how social utility maximization shall be ensured; how social welfare shall be measured; how collective decision-making mechanisms should be and how public policies shall be designed. The discussion starting with search of efficiency in public economy firstly focuses on explaining the functioning in public economy. While researches focus more on microelements, which affect the functioning in the public economy, in time, they endeavor to enlighten particularly motivation sources of actors, which operate the system and relations amongst sections, which give production decision (policy-maker), public employees (bureaucrat) and consumer (citizen) while production decision of public goods are taken. First settled theory coming to mind regarding this matter is Public Choice theory. This theory endeavors to explain economic and politic relations in public economy by explaining motivation elements of actors of voting and bureaucracy models by dealing with problems in terms of political self-interest. Upon formalization of forward-looking expectations by New Classic Economists within same period by reinterpreting rationality, new political economy comes out and connections between economic outcomes and politics become explainable by motivations, which affect the behaviors of economic actors. According to Alesina (1991:4), developments both in rationality and game theory have caused this. The models, which particularly take interest groups and distribution conflict between them, are formed by benefiting from the game theory. Thus, along with the arriving of the 1980s, the connections between economic business cycle and political business cycle have started to be modeled under titles such as the political economy of budget, the political economy of macroeconomic policies, the political economy of stabilization policies, and the political economy of economic reforms. This literature explains especially that why consecutive mistakes have been made in high and chronic inflation countries and causes of failure in stabilization policies with the political perspective. Therefore, it is called as the political economy of inflation.

The literature asserting that the success chance of stabilization policy has been left to opportunistic behaviors by making mistakes on the timing of stabilization policy implemented
by countries to get rid of chronic and high inflation is used to explain political cycle term. However, opportunistic theory alone is not sufficient to explain the political business cycle. For, all political traditions and systems of countries being formed depending on their social, political, institutional and historical differences may be placed under the concept of political cycle. Therefore, a political cycle should be considered wider and contain all elements unique to the political system beyond election periods and opportunistic behaviors of politicians. While Rogoff and Sibert (1988:1, 13), Persson and Tabellini (1990:6) mentioning about rational opportunistic theory, they have preferred to use the concept of the electoral cycle of macroeconomic policy variables. Thus, the concept of the electoral cycle may be used to explain economic outcomes during and before election years namely, short-term results. The concept of the political cycle reaches to a state that it may explain long term economic outcomes, the political tradition shall bring forth. In such a case, all features regarding political climate of countries may influence economic outputs. Apart from this, we may mention about the existence of a political cycle being correlated with reverse causality and obligation to implement stabilization policies.

In the literature, an emphasis on developed countries with democratic system is frequently made. The number of studies conducted for developing countries is relatively less. In this case, a need that the mentioned theories should be dealt with a different perspective for developing countries comes out. After all, the institutional infrastructure, which affects the preference of macroeconomic policies, shall preclude the possibility of electoral cycle formation in countries, which has settled institutional culture and which uses economic rules. In developing countries, the possibility that the politicians may take political decisions with opportunistic and partisan incentive is higher. Therefore, it shall be more beneficial for policy-makers, the developments in literature to focus on different political causes for two different country groups and the studies to increase in that manner. The number of studies related with developing countries has started to increase from the mid of 1990s. For instance, electoral cycle and changes in the composition of public expenditures in developing countries have been examined in the study made by Vergne (2009). According to this study, it shall be more logical to form the models to be made for such countries depending on the opportunistic approach since it is not possible to see Western type right-wing and left-wing ideological differences. According to Yilmaz (2001), the fact that there is no supervision and control mechanism within democratic system in Turkey and similar countries, causes political parties or groups frequently to tend towards populist policies and be unwilling on implementing stabilization policies.

The new political economics literature has particularly focused on inflation problem while dealing with stabilization policies being implemented to solve economic difficulties. It has explained high and chronic inflation with reasons such as money printing, long lasting fiscal imbalances and excessive public indebtedness coming along, monetization of debt. However, the stabilization policies for the unemployment which takes place on the opposite side of economic
fluctuation are most of the time not a part of this discussion. The reason of this situation becomes understandable with the division of literature into two which makes the explanation of economic business cycle based on political themes. For, the basis in the study of Nordhaus (1975), which is shown as the main text regarding the political business cycle in new political economics is the short-term Phillips curve. In the study, the views of the voter on unemployment and inflation has been explained and an emphasis has been made to the fact that voters would tend towards using public finance instruments, which are noticed in an easier manner before election periods. Accordingly, it is set forth that it shall be referred to expansionary policies to be reelected. In other words, the macroeconomic policy depending on electoral cycle has been conceptualized. However, the studies, which explain the political causes behind failures in stabilization policies, have been correlated with inflation's becoming chronic especially due to fiscal indiscipline seen from 1970s. Also, according to conventional approaches, it is deemed that the budget deficits occurred due to expansionary policies would increase tax revenues by creating employment and growth. Thus, fiscal instability would be compensated with the economic effect the policy would bring forth and it shall not be necessary to mention about the burden the stabilization policy shall cause and the sharing of the same. In fact, in case of failure of a stabilization policy to reduce unemployment, fiscal deficits may not be compensated and the subject how the benefit to come out while the expansionary policy is implemented shall be divided pertains to politics and economics.

2- The Political Economy of Political Business Cycle and Macroeconomic Policies

According to Vergne (2009), political business cycle theories seek to explain that portion of cyclic behavior in macroeconomic variables which are related to the timing, characteristics, and outcomes of elections. Thereby, there is an economic fluctuation depending on political motivations. In other words, an economic fluctuation subject to the political conditions is created with the implementation of an economic policy as result of effort to look cute to the public (increasing public expenditures and changing its composition) or need to send fiscal competency signal in election periods. The studies made on the political business cycle depart from two significant studies. The first of these studies based on two different political motivation emphasis pertains to Nordhaus (1975) and the second to Hibbs (1977). The political motivation being emphasized in the study made by Nordhaus (1975) is “opportunism”. Mentioned study conveys that the incumbent shall approve an economic policy to influence voter preferences in election years not to lose power namely, to be reelected. The instruments they may use to do this are the macroeconomic policy instruments such as social transfers, taxes, budget deficits, money supply. The political motivation given in Hibbs (1977) holds the opposition

Cyclical budget theory being developed by Hansen (1941:193) who is a Keynesian economist is a general acceptance on this situation. He states that the budget deficit to be had during recession shall be balanced with the budget surplus in expansion period. The tax smoothing model asserted later by Barro (1979) states that budget balance would be achieved thanks to cyclical sensitivity in public expenditures even though taxes are not affected from cyclical movement.
nature against Nordhaus’ thesis. The dominant motivation in this study is ideological foundations. The incumbent implements an economy policy by being loyal to ideological preferences of its constituencies to be reelected. In the literature related to political business cycle of budget deficits or explaining political business cycle of macroeconomic policies, the titles of political fragmentation and instability take place as two separate reasons apart from political opportunism and partisan theory. These titles are political system differences, which may be tested through models based on opportunism and partisanship, rather than being the main cause. For instance, despite the fact that political economy studies generally handle two-party systems, some studies deal with fragmented governments, political polarization, strategic games between power and opposition. Political incentives in the same are either opportunism or partisanship.

2.1- Opportunistic Theory

It accepts the very existence of policy-makers who try to maximize the possibility of being reelected. In the essay written by Nordhaus in 1975 titled as “The political business cycle”, it is stated that the parties in political system act rationally and benefit from the short-term reverse correlation between inflation and unemployment rates on Phillips curve to convert the choices of voters to their own favor. The voters act in accordance with their past experiences rather than aggregated expectations. In such a case, their both political choices and expectations are depending on their past experiences. They decided whether to vote for the incumbent by comparing the behaviors of the party with their ordinary behaviors. In other words, they do not vote for the incumbent if there is deterioration in economic conditions. Such study mentions about the partisan incentive upon the USA. It states that the Republicans in the country shall prefer a point lower than the one on the short-term Phillips curve, for, they would have anxiety on inflation; that the Democrats shall prefer a point higher, for, they would wish lower unemployment. However, the purpose of political parties is not to win partisan voters but to win the “swimming voter”. It is expected the public expenditures and public debts to increase from years before the election to be reelected.

According to Alesina and Perotti (1994: 13), the argument brought in the political business cycle thesis of Nordhaus is slightly contained in the fiscal illusion approach brought by Buchanan and Wagner. In accordance with the fiscal illusion approach, the voter does not understand the intertemporal budget constraints of the government. This is used by the politicians; and the politicians, who would like to be reelected increase public expenditures more than taxes. The voter overestimates the benefits of current expenditures and underestimates future tax burden. While the politicians are volunteer in sustaining budget deficits in recession periods but not in sustaining budget surplus after the recession. However, such behaviors of the politicians are

---

4 The idea of Nordhaus in political business cycle theory that the politicians shall act in a manner to maximize their votes and that voters shall vote to maximize their own benefits is the very main theme of Representative Democracy Model of Downs (1957).
not punished since voters experience the fiscal illusion. Both studies accept that expansionary policies shall be implemented in election periods. Voters’ failure to learn from past causes politicians to be awarded. Actually, in models where rational expectations are included, this possibility shall weaken and they shall be required to be more careful in respect of opportunistic behaviors of politicians.

After Nordhaus (1975), Rogoff and Sibert (1988) have expanded such study and emphasized that the election year was important, not the years before the election. According to such study, the voter questions the competency of the incumbent. The thing the incumbent is required to make is to convince the voter that everything is done well. It may do this only through fiscal indicators. Therefore, it sustains public services by increasing public expenditures or reducing taxes within the year of election. It also makes less public indebtedness within the same period. Such study is separated from Nordhaus’ study based on two features. First of all, the main status which ensures it to take such action is the fact that the government has an advantage to have more information than the voters. The government, which consciously makes less indebtedness within election year, gives the message that budget deficit is low and everything is fine. Since the information owned by voters is less and the real situation of the economy shall become visible after the election, they shall vote by perceiving this as a fiscal competency sign. In such a case, the electorates’ expectations should not be based on the sum of their past experiences, but they should be forward-looking so that they can vote positively for the government’s pre-election message. According to Alesina, Roubini and Cohen (1997: 23) while the government is aware of its competency, the voter shall assess this in accordance with economic outcomes. The opportunistic behavior of the government shall create a fluctuation on economic outcomes. Despite the fact that such study has significant differences from the first study, their conclusions are similar. In the studies of Alesina (1991: 10) and Alesina and Roubini (1992: 664), it is mentioned about an additional consequence for that model called as rational political business cycle and similar models. In the models where the voters are rational, the opportunistic behavior of politicians shall be limited. Therefore, the electoral cycles in rational models are short-lived and their sizes are smaller compared to the ones in Nordhaus’ study. There are also studies, which again explain with political causes that the electoral cycle may not occur. According to Sjahrir, Kis-Katos and Schulze (2013) while the possibility of formation of the electoral cycle or the political business cycle is high in countries where direct election system exists, there is no reason to support the formation of political business cycle in countries like Indonesia where indirect or dual election system exists. The political parties, which fail to keep the majority in the local parliamentary, may not increase the total budget since they are unable to be dominant over the whole budget process.
2.2- Partisan Theory

It emphasizes that different political parties represent the interests of different constituencies and that the policies being pursued are the policies, which their constituencies prefer. The essay called as “Political Parties and Macroeconomic Policy” written by Hibbs in 1977 is related with the determination of ideological goals in accordance with the short-term Phillips curve. According to the same, when left-wing parties have to choose between inflation and unemployment, the choice they make will be different from the right-wing parties. The goal of left-wing parties is to reduce unemployment. Therefore, they are volunteer to carry the cost of inflation while struggling with unemployment. Right-wing parties and their members have opposing preferences and accordingly, they are more anxious in respect of inflation. The political parties represent different constituencies. The constituencies of right-wing parties are the high-income class, population which belong to the business and finance area and the constituencies of left-wing parties are lower income groups and unions. The choice between inflation and unemployment is related with the effect of the same on the distribution results. Despite the fact that opportunist policy-makers would like to choose policies which shall win the election, partisan policy-makers would like to win the election to implement the policies their constituencies so desire.

Alesina (1987) has added rational expectations to the model of Hibbs, which it has called as the partisan model, and created the rational partisan model of macroeconomic policies. The assumptions of the model have almost not been changed. Only the assumptions that the voters have different preferences about inflation and unemployment and they shall vote to the party, which shall provide expected maximum benefit, and that the policy-makers may directly control the inflation, have been added. Accordingly, if nominal wage contracts are concluded within a certain period of time then, a political business cycle shall come out. With its simplest explanation, it states, in case of any sluggishness in model wage arrangements, that the changes in inflation rate shall create temporary deviations from the natural rate of real economic activity and bring along the change of government. While it is stated in Hibbs’ model that the inflation shall at all times remain high as long as unemployment is low, Alesina states that it may change. There is a possibility to create high inflation for the cost of reducing unemployment, namely, equilibrium may be achieved in high inflation trap without any improvement in unemployment rates.

A political business cycle, which comes out depending on election periods, plays a role in determining economic fluctuations. The course of these fluctuations may be correlated with their tendency to expansionary economic policies of policy-makers before the election and/or election periods. It is assumed that the policy-makers in office increase public spendings both with partisan and opportunistic motivations. While the fact that the partisan and opportunistic incentives are dominant rather affects the composition of public expenditures, a need to implement
contractionary policy in the economy generally comes out after the election. When the budget deficits to emerge as result of increased public spendings are funded by referring to public indebtedness, the aggregated expenditures shall increase and accordingly, inflationist bias shall be inevitable. Especially maintaining excessive indebtedness propensity arisen since the 1970s has left countries face-to-face with chronic inflation problem. As a result of this, experiencing debt crisis and hyperinflation problem has created the obligation to implement stabilization policies.

3- Political Cycle of Stabilization Policies

It is not so easy to deal separately with reasons of failure of stabilization policies. Despite the fact that the studies made on this subject have benefited from a similar modelling, they mention about many different causes. However, three main reasons have been used depending on the tendencies of studies and sub-reasons they comprise have been included for the subject to be understood better. The literature, which brings subjects forth such as political system, election system, uncertainty, political instability, emphasizes on two constraints, which form the behaviors of politicians above all. One of them is political constraints and another one is credibility constraints. The political constraint is the fact that the preferences of policy-makers are constrained with the behaviors of political actors. The credibility constraint is the fact that governments are aware that they are monitored by the citizens. The political constraints become binding if only political actors hold conflicting goals. However, credibility constraint shall appear even if the groups in society do not hold different goals. Therefore, in accordance with Persson and Tabellini (1990:3), for a policy to be optimal, the duty on the governments is to give credibility signal to private sectors as much as possible. The possibility of the political authority to give up from the policy it has announced in cases when there is conflict of interest between political authority and remaining of the society and the political instruments of the political authority is lacking. It is possible to take various measures for this. For instance, since the existence of participation of an international financial institution in the program shall increase the costs of abandoning the policy, it may be seen as a credibility signal. Central banks' independence that is monetary authority or policy rules being adopted through law shall give the signal that it is decisive in struggling economic problem. Credibility constraint has two sides. Since the policy-maker is aware that its goals are monitored by the citizens, it is obliged to increase the chance of implementation of the policy by managing expectations. It is not sufficient for the stabilization program to be put into operation to be stable and accordingly convincing. The government, which warrants that it shall be implemented, should also be competent. The biggest motivation of the government in respect of protecting its reputation is the possibility of being reelected. In such a case, one of the reasons being most important, which affects the legalization, sustainability and thus, chance of success of stabilization policies is the credibility occurred from the nature of political process. Credibility holds the nature of processor reason in respect of the applicability of economic reforms. As it shall not be possible to
implement economic reforms if there is no credibility, maintaining the same shall not be possible if they are put into operation. According to Martinez (2009), the reputation of the government, which is a part of credibility, even passes forward to electoral cycle. If the confidence against the government is high then, the importance of the fact that the election period is close shall decrease in policy preferences. In cases when stabilization policy has credibility, timing errors may occur due to political interests and distribution conflict.

The fact that the inflation may not be solved despite the reasons of high and chronic inflation are known, shows that the political and institutional elements, which stimulate the inflation process should be researched. A reluctance on the implementation of stabilization policies may be seen in many countries despite inflation is experienced for long years. One of the actors in political decision-making processes is groups of interest. Groups of interest are formed with the gathering of individuals with common taste and preferences and called as influence groups when they have certain power on the incumbent. Lobbying activities of capital groups today may be presented as an example. Also, political groups holding common goals are effective on decision-making groups as one of these interest groups. Such groups are called as political elites or ruling elites in literature. As political elites may make changes on a political decision in the adoption process to increase their utilities, they have the effect to delay the timing of the decision to be taken. In such a case, conflict interests, which may be experienced between different groups in the society such as political parties, unions and employers, increasing inflation more by preventing stabilization policies to be implemented on the right time and in a complete manner. The economic reforms to be implemented to ensure economic stability shall bring a fiscal burden forward and the disagreements being experienced on how such burden shall be shared, shall cause the delay in the economic improvement. In Alesina and Drazen’s (1989) studies, the political disagreements between socio-economic groups are modeled as a war of attrition. Another pioneer study, which deals with the war of attrition model with some modifications has been made by Drazen and Grilli (1990).

The main source of war of attrition model is the food fight between animals. Smith (1974) has analyzed the fight of two animals on food being offered as an award. While the winner becomes the owner of the award, it suffers severe pain due to wounds it has taken during the fight. The model, which deals with the fight between animals, have been used in the economics after biology. It has been used for the fight to gain more shares in two-company industry models. It has also been benefited in subjects such as patent competitions, labor strikes, and public goods. The main theme of the model is to make the competitor give up from what may not be shared. In the war of attrition model, each player waits for a certain period of time and suffers pain during such period. At some point of the time if the competitive player has not left the game then, one of the players would have to give up. A similar conflict of interest is experienced during the design of stabilization policies. In cases when the agents in the economy has

---

5 See: Bulow ve Klemperer (1997)
complete information, traditional stabilization policies come out and it is seen that only Nash balance exists in the model. In cases individuals have complete information, it is seen that they are not different from each other and accordingly, the period of resistance to stabilization policies becomes either same or a slight difference ensues. The real challenge is experienced in case of asymmetric information. For, the players have private information other player fails to have. Alesina and Drazen (1989) uses war of attrition in case of asymmetric information to explain the causes of delays in stabilization policies or economic reforms, which aim social benefit. Fiscal deficits, which are one of the main causes of inflation, are funded with debts and distortionary taxes (inflation tax) until reconciliation. Failure to reach an agreement on how the tax burden, which stabilization policy shall cause, shall be distributed, starts war of attrition. This challenge shall end when one of the parties in this challenge game warrants paying huge part of the increase in taxes, which shall remove budget deficit, and the stabilization policy shall be able to put into operation. Each group is aware of their costs despite the fact they are unaware of the costs the other side shall suffer. Rationality exists related with waiting in both groups at the beginning of game and seeing the opposing party to accept the burden. When the marginal benefit of carrying the burden is equal to the marginal benefit of waiting, the revenue, which waiting for the other period shall bring, shall be equal to the cost to be suffered in this case. In such a case, it is inevitable, according to Alesina and Drazen (1989) that the instability shall spread to longer time in countries where political polarization is higher. Also, while moderate losses in welfare extend stability process, the existence of significant losses shall facilitate reconciliation. Since economic policy measures such as indexing shall facilitate the losses of all individuals in the society emerged from the inflation, they shall delay the implementation of stabilization. According to authors, the status of England, Germany, France and Italy after the First World War constitutes an example for this. Since one single political party has high majority in the parliamentary in England, taxes have been increased by taking immediate measures against budget deficit and foreign debt problem. However, the existence of both right-wing and left-wing parties in the parliamentary of other three countries has prevented reconciliation on who shall carry the burden of stabilization. The authors have explained the reason, which has created delay in the stabilization under the title of political interests, with the majority of power in the parliamentary or the degree of political polarization. Adams (2000) has researched how three special economic reform measures have affected the benefits of eight different social groups. It compares the advantages and disadvantages each reform shall create in respect of social groups. It presents that the tendency of refusal or postponement of reform measures, which increase losses in conclusion.

6 Nash balance is a concept being used as basic solution in games where there is no cooperation. Each individual’s strategy is the best strategy for it. Accordingly, each individual participates to the game with its own strategy (Dixit ve Skeath, 1999: 82).

7 See: Myatt (2005), Asako (2015)
While the concept of political fragmentation is used to define circumstances where many parties have been represented in parliamentary systems, the term of political polarization has been used as densification of conflict between political parties. Roubini and Sachs (1989) reveal that budget deficits increase in countries where political fragmentation is high. While it is easy to take and implement decisions in single political party is in power, it is that much hard when coalition government is in power. Therefore, stabilization policy is delayed until reconciliation is reached. Cukierman, Edwards and Tabellini (1989) have asserted that the conflict between political parties has made the effective implementation of stability program impossible in cases polarization is dense. They have particularly dealt with tax reforms and revealed that policy-makers have tended towards seignorage and postponed tax reforms in case where political polarization is high. Veiga (2000) has examined twenty seven stabilization policies implemented in ten Latin countries between 1960 and 1990. The study shows that the possibility of approval of stabilization policies reduces and stabilization policy is postponed until serious crisis is experienced in countries where political fragmentation is high namely, where many political parties exist in the parliamentary in terms of proportional representation. Some studies show that a competition to gain advantage may start amongst political parties while examining the possibility of existence of excessive political polarization in two-party system. Alesina and Tabellini (1990) presents that the incumbent may use public debt to leave bad inheritance to next political party. As the degree of polarization between two parties increases, the level of public debt increases.

According to Padavano and Venturi (2001: 18; 43), political stability theories contain two different classifications. While the political challenges to which war of attrition model focuses are rather related with political fragmentation, the political stability contains another approach which contains stability and office of governments for a sufficient period of time. In such a case, while the degree of political fragmentation takes place on one side of political stability, the expected period of office of governments takes place on the other side. In some of the studies, which deal with the degree of fragmentation of political system, political instability is presented as a separate reason. Such study is not directly related with stabilization policies. However, it states that the political fragmentation is important in respect of ensuring fiscal balance but the period of office of the government is not very important. Accordingly, the tendency of coalition governments to use public debt is high. Alesina and Tabellini (1989) has researched the relation of political polarization and political instability with domestic investment, foreign debt and capital escape. The study, which has not directly focused on delays of stabilization policies, states that the effect of political polarization on delays is higher. Dolar and Svensson (2000) has researched the reasons of success and failure of structural adjustment programs. The authors, who have made their research on African countries, have concluded that the possibility of failure of programs had risen in countries where there was political instability and there was no democratic election. According to Yılmaz (2001), the common side of Argentina and
Brazil of Latin American countries is the existence of military coups in their political regimes and their political parties are far from forming the foundations of the democratic system. Accordingly, the political systems of these countries are unstable. There are of course differences between these countries and Turkey. While Argentina and Brazil are two countries which could curb excessive inflation before Turkey by renewing democratic processes, Turkey could not succeed this especially due to interests of political elites. While unions and labor rights are more active in both countries, the situation in Turkey is on the contrary. The conflicts between central administration and local authorities in Turkey is another institutional cause, which increases budget deficits and delays stabilization.

The government system is stated as another cause, which delays stabilization policies. If the country is administered from a single hand through an autocratic system then, the possibility to face resistance in respect of the implementation of stabilization is low. However, it is difficult to take a decision regarding stabilization policy in democratic systems. In other words, conflict of distribution happens in a harsh and long period. The studies related with the war of attrition model explain delays in stabilization either with political interests and distribution conflict or uncertainty. In such a case, all political elements, which are possible to create distribution conflict and which causes such conflict to extend should be dealt with around this main reason. Causes such as political polarization and fragmentation, political system or political regime type, political instability, strategic game amongst competitor parties are included under the title of political interests and distribution conflict. Uncertainty is related with the delay of the operation of stabilization policies since it is uncertain that who would benefit from the stabilization to be implemented and what would happen after stabilization.

Fernandez and Rodrik (1991), explain delay in stabilization with the uncertainty factor. They have researched why the economic reforms, which shall provide benefit to the majority of population, have been rejected. It actually indicates to bilateral losses on which asymmetric information plays a role. A challenge occurs between the employees of two sectors in an economy where a business reform shall provide benefit. A conflict between employees working in the export sector and in the sector competitor to import shall cause both sides to lose. The wages in the export sector shall rise thanks to the tariff to be removed however, it shall decrease in the sector competitor to import. While export sector employees support such reform, the employees in another sector shall resist since they are unaware of the benefits possible for them to acquire. The improvement to happen in case of removal of the tariff, shall allow employees of another sector to work under better conditions by moving to this sector. However, this reform attempt, which shall create improvement in the status of the majority of population, shall conclude with failure. The existence of uncertainty complicates reforms.

A perspective different from Orphanides (1996) has been brought to the element of uncertainty. It asserts that the political decision-makers take the decision of delay as an optimal decision.
This opinion is in fact similar with the opinion below that implementing stabilization in periods of crisis becomes easier. It is stated that people’s support for stabilization shall increase as result of deterioration arisen in economic problems along with delay. The model being used by the author, reveals that the incumbent has taken an optimal decision and is rational. For, if the inflation rates are still not perceived very bad and are found bearable then, the postponement of the reform by the incumbent is optimal. Leaving people with an excessive burden while there is a situation, which may be accepted readily, shall remove the chance of being reelected.

There are studies, which state that crisis would break political and social resistance besides all such reasons. There is a point where it shall not be possible to postpone stabilization policy. It becomes easier to implement stabilization policy when economic crises are experienced or the cost of living with inflation has become excessive and unbearable. Drazen and Grilli (1990) emphasize that the crises are the ones which make stabilization acceptable. Excessive and sudden tax increases are neither acceptable for social groups nor applicable for political parties. Such political measures which both parties shall face with resistance, shall be acceptable along with an economic crisis. This situation, namely, the existence of crisis shall break the resistance by minimizing distribution conflict and become a method which governments may refer to increase welfare loss. Bruno and Easterly (1996) assert that the countries experiencing high inflation and external debt crises will be more successful in implementing economic reforms and will experience a faster recovery than low-inflation and external debt crises. It also states that decrease in the foreign aids entering the country would shorten the period of delay and contribute to welfare increase. There are also political economy studies, which assert that in such cases the expectations would change in an affirmative direction and economic outcomes would be expansionary despite contractionary policies, since the belief on the necessity of stabilization policy shall become widespread.

There is almost no study, in the literature regarding electoral cycle and political cycle of stabilization in case of the existence of a monetary union such as Euro Zone that the results would change or whether it would change or not. As membership to monetary unions decreases the policy instruments the countries may use on their own, the fiscal rules they have to apply, restrict the use of remaining instruments. The results of stabilization policies being implemented in such type country groups are not in harmony with results in new political economics literature which deals with political cycle. According to Jochimsen and Nuscheler (2005), fiscal federalism being used amongst the states of Germany removes the possibility of abuse of stabilization policies. The authors, who have researched political economy of budget deficits, may find evidence regarding neither opportunistic incentives nor to partisan incentives. They also conclude that the propensity to refer to public indebtedness has not increased and a trap has not been set up to leave debt to following government in coalition periods.
Conclusion and Assessment

It should be paid attention to differences and causalities regarding economic policies and stabilization policies depending on political cycles in the political economy literature. Political cycle related to economic policy is the implementation of the conscious and even unnecessary economic policies of the incumbent acting with desire for reelection. Public expenditures, taxes, money printing, budget deficits and public indebtedness are used as instruments providing advantages in an economy being delivered to the hands of politicians regardless of economic conditions whether based on partisan incentive or opportunistic incentive. Excessive budget deficits, high public indebtedness or excessive money supply occurred as a result of this cause high inflation levels in the economy. The need for stabilization policy arisen in such a case, again go under the domination of political motivations and stabilization policy is either postponed or implemented as defective and deficient. Therefore, opportunistic incentive becomes dominant in studies made for stabilization policies and convert to a distribution conflict amongst interest groups. The political economy of economic reforms or stabilization policies should be handled under separate titles. In other words, the electoral cycle of macroeconomic policy and the political cycle of stabilization policy should be separated from each other. It is stated in the studies made in this field that both political parties and vote groups have acted opportunistically and shall avoid the burden such policies shall create. Under the stabilization policy title where the partisan incentive is not mentioned, socio-political past and cultural inheritance are ignored. If stabilization policy shall be implemented in a society who gives importance to their high traditional values then, it may be possible to mention about masses who shall be volunteer to carry its burden. In societies where especially, democracy culture is not formed completely, the possibility for voters to keep values front rather than wages and prices in objective functions may be higher. The very low loss in the vote rates of the incumbent at the 2018 election made in Turkey, despite of high unemployment and inflation rate, may be interpreted as an indicator of this.

Economic and stabilization policies, which are designed to ensure macroeconomic stability, are based not only on technical analysis but also on political and social components. Therefore, political cycle literature, which states that an equilibrium deemed as sub-optimal represents the optimal when certain political interests and partisan tendencies are taken into account, is quite wide and complex. Understanding and improving this literature which includes not only positive explanations but also normative circumstances shall provide great convenience for policymaker and management of the economy. Since failure or timing errors of stabilization policy in any country mostly arises from politics, the convergence of institutional foundations in countries and formation of political awareness towards the direction of country benefit, may break the domination of politics. In countries where opportunistic incentives are not dominant, it is possible to experience fewer difficulties in respect of the implementation of stabilization policies.
References


Introduction

Poverty is one of the most important social and economic problems facing mankind. Eradication of poverty has been seen as the main objective of economic development and social welfare, which has become one of the important issues of poverty. As a result, poverty has begun to take a special place in the literature.

Poverty, defined as being unable to meet the basic needs of individuals such as nutrition, housing, education and health and being behind social standards or deprived of the opportunities required for life, has become one of the most important problems in the national and international agenda with the migration crisis experienced in recent years. Migration, in fact, causes poverty in countries, while on the one hand, is presented as a solution to reduce poverty. At the same time, in some parts of the world, under certain conditions, poverty can be a major cause of migration, while in other parts of the world, under different conditions, the poor may be among those who do not migrate because of various obstacles, causing their poverty to become chronic (Kothari, 2002; Skeldon, 1990).

It is very important to reduce poverty in order to increase social welfare. If migration can be an opportunity for social welfare and development, it can be seen as an economic and social strategy to get rid of chronic poverty. Generally, people migrate for a higher salary, better life, and job opportunities. They are also forced to abandon their countries to survive, to reduce their poverty, for reasons like war, famine… In addition to increasing the living standards of migrants, international migration has been suggested to contribute to reducing both poverty and the balance of payments deficit.
However, a new report by the International Labor Organization (ILO) emphasizes that poverty rates have been increasing in EU countries (ILO, 2016). Migration is one of the most important social and economic problems in recent years for many countries in the world, especially in the EU countries and Turkey. In this regard the poverty and migration relation appeals more interest and attention in the literature. Migrants often abandon their places to stay, work or settle in other places to get a better standard of living for economic and cultural reasons. Particularly after an economic crisis or after a war, people migrate to seek the remedy in other countries. As a result of the problems experienced in the Middle East region in recent years, almost all countries face the problem of external migration. It is argued that migrants become unemployed or earn less income by working in informal sectors and make less use of education and health services by living in unhealthy environment conditions, resulting in poverty. Moreover, in countries with extreme migration, migration is thought to have severely impacted countries and exacerbated poverty by pushing the country’s absorption capacity (Wu and Hung, 2007). Another view suggests that the phenomenon of poverty is an obstacle in front of the migration because it restricts the area of movement of the poor people making it difficult to cover the costs of migration. Accordingly, it is thought that better life and job opportunities are prevented because of the low opportunities of people who are forced to leave their homes due to reasons such as famine, poverty, natural disasters, war and the high cost of movement (Birks and Sinclair, 1980; Şenses, 1999). It is also thought that the absence of certain types of social capital, such as social networks or contacts with potential employers, limits migration in poor households as an option. All these factors cause poverty to deepen further. In other words, individuals/groups can become chronically poor by adopting migration as a means of livelihood strategy, or they can move out of chronic poverty. This situation is expressed in Figure 1 as follows: There are two options for chronic poverty caused by resource shortages, capital shortages, and discrimination such as identity, ethnicity, religion, gender: either stay or migrate. Most of the non-moving people (stay put), are thought not to move due to obstacles such as cost, social network inadequacy, illness, disability, lack of education. These people who do not move will continue to be poor in this situation or when immigration is an undesirable situation for an immigrant country, they will come out of the poor category, using the policies and incentives that governments are applying. In general, it is thought that stability will be achieved with the prevention of emigration in Western development models, so staying at home is encouraged. A migrant who moves in order to avoid chronic poverty is faced with two different situations: Migration will not always bring the desired standard of living or business opportunities. In this case, lag behind education, the lack of appropriate accommodation conditions and poor living standards will make poverty chronic by making individuals poorer. In another case, there is an exit from poverty by raising the standard of living by using appropriate employment opportunities in the country where migration is being carried out (Kothari, 2002).
In the literature, the relationship between migration and poverty is generally considered theoretically or analyzed on a micro basis for a single country. In this context, this study aims to investigate the causality between poverty and migration for the EU countries by panel data analysis method in which both the cross section and the time dimension coexist. In the present study, the Canning and Pedroni causality test was used to reveal the relationship between migration and poverty, which gives the direction and sign of the long-term causality relationship. In this way, it is determined in which countries migration brings poverty or reduces poverty or causes migration.

This study aims to determine the long-term relationship between international migration and poverty in EU countries and Turkey, which is a candidate country between 1990 and 2015, consists of five parts. In the first part, the purpose and importance of the study were included, while the second part mentioned the studies on migration and poverty. In the third part, the data used in the study are introduced and the pretests of the method and method are given. In the fourth part, empirical findings of the long-term causality relationship between migration and poverty are included, and in the last part, results and evaluations are discussed.

**Review of the Relevant Literature**

In the literature, migration and poverty are examined; the studies generally consider migration as internal migration rather than international. The study includes the literature on international migration since migration is considered internationally. The studies examining the relationship between international migration and poverty are particularly limited for groups of countries. In this regard, it is thought that this study will make an important contribution to the literature.

In some studies, poverty and migration were investigated for a single country. One of them is the study dealt with by Lipton (1980): a study examining both the effects of migration from the rural to the urban and the effects of international migration on poverty and income inequality.
in India. As a result, it was stated that international migration increased income inequality in rural areas and had no positive effects on poverty.

Zeza et al. (2005), they emphasized that Albania is an intensively emigrant country in 2001 and about one-fifth of the population lived abroad. In the study, the relationship between migration and poverty in this country was examined by spatial analysis for the beginning of 2000. As a result, they concluded that poverty is a driving factor for internal migration, but it is a restrictive factor for international migration.

Pernia (2008) examined the effects of international migration on household welfare and poverty reduction. As a result, remittances for Philippines have found that household savings, education and health spending are increasing, and is important move-out of poverty.

Wouterse (2008) came out of the household surveys in 2003 in his study of Burkina Faso, an African country, to determine the relationship among migration, poverty and income inequality. The finding that international migration is seen as a strategy for increasing incomes for the rich households, and that internal migration is made to compensate for the income shortfalls of relatively poor households has been obtained. It also suggests that the households with international migrants are less poor and, in particular, that international migration plays an important role in reducing poverty. However, there is evidence that the limitation of migration among poor households adversely affects its capacity to reduce poverty.

Stark, et al. (2009) investigated whether relative poverty in Poland altered the tendency to migrate. They concluded that the relative poverty, calculated from income inequality and per capita income, was positively associated with migration. It is emphasized that the poor tend to migrate.

Bylander (2017) examined the relationship between poverty and migration in the South-South corridor, from Cambodia to Thailand and Malaysia. Here, it is tested whether the poor migrate less than those with more resources. In Malaysia, as a result of the fact that emigration is carried out through official recruitment channels, the costs for emigration have increased, but migration in Thailand has become "pro-poor".

One of the studies addressing migration and poverty for a particular group of countries is the study taken by León-Ledesma and Piracha (2004). In this study, the effects of remittance on employment performance for 11 Central and Eastern European countries were examined between 1990 and 1999: they concluded that remittance has positive effects on productivity and employment, investment, and therefore is effective in reducing poverty.

Adams and Page (2005) used cross-sectional analysis to examine the impact of international migration and remittances on poverty for 71 developing countries, taking advantage of countries' survey data from the 1990s. They have found that remittances and international migration in developing countries significantly reduce poverty levels and depth of poverty.
McKenzie (2017) examined the findings of studies on migration, inequality and poverty for developing countries over the past decade. In developing countries, it is underlined that the impact of migration on poverty and inequality depends on the people who will migrate. It is emphasized that when the networks are wide or when immigration policies offer more options for unskilled workers to migrate, poverty is reduced, but domestic inequality and liquidity constraints prevent the poor from benefiting from migration.

Data and Methodology

The long-term causality analysis of the relationship between poverty and migration for EU countries between 1990 and 2015 was based on the human development index for the measurement of poverty. The human development index is an index that includes life expectancy, literacy rate and income. This index value has been subtracted from 1 for poverty. Thus, the multidimensional poverty index, which includes health, education and income, has been achieved.

Migration was measured by net migration. Net migration is defined as the difference between the migration received and given by a particular area. The net migration is positive if the migration received by a particular area is more than it is given. Otherwise, net migration is negative if it is more than the emigration it receives. The Human Development Index is derived from the United Nations Human Development data, while net migration is derived from the World Development Indicator database of the World Bank.

Before the causality analysis between poverty and migration, some preliminary tests are needed to determine the stability levels of variables and whether cointegration is integrated. In the first stage of the preliminary tests, the cross sectional dependency and the heterogeneity of the slope coefficients are investigated. The cross-sectional dependency can be defined as the effect of shock in the i. country at any point of time on the j. country at the same point or later.

\[ CD = \sqrt{\frac{2T}{N(N-1)}} \left( \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij} \right) \Rightarrow N (0, 1) \]  

(1)

In CD test, the null hypothesis says that there is no cross-section dependency, and the alternative hypothesis says that there is cross-section dependency. \( \hat{\rho}_{ij} \) shows the correlation coefficient for countries i and j in the formula (Pesaran, 2004).

The CADF (Cross-sectionally Augmented Dickey-Fuller) unit root test, which is used in case of cross-sectional dependence, also takes into account heterogeneity. The CADF test, developed by Pesaran, is the expanded version of the ADF regression, taking into account the average of the cross differences of the first differences and lag of each country:

\[ \Delta y_{it} = a_i + b_i y_{i,t-1} + c_i \bar{y}_{t-1} + d_i \Delta \bar{y}_t + e_{it} \]  

(2)
Here, the $i$ index represents the cross-section (country), the index $t$ is time and, $\Delta y_{it} = y_{it} - y_{i,t-1}$ (Pesaran, 2007).

Delta tilde ve delta tilde adj, which homogeneity test determines the heterogeneity of slope coefficient, that is, whether slope coefficients differ from country to country, developed by Pesaran and Yamagata (2008). This test is valid when the number of cross sections is greater than the time dimension ($N>T$). The calculation is as follows:

$$\Delta = \sqrt{N} \frac{N^{1/2} \hat{\sigma}}{\sqrt{k}}$$  \hspace{1cm} (3)

The adjusted version of Delta test deviations in small samples is calculated as follows:

$$\Delta_{adj} = \sqrt{N} \frac{N^{1/2} \hat{\sigma}_E(\hat{\gamma}_{it})}{\sqrt{\text{Var}(\hat{\gamma}_{it})}}$$  \hspace{1cm} (4)

Where, “$S$” represents swamy test statistics, “$k$” is the number of explanatory variables. The null hypothesis of Delta test is that the slope coefficients are homogeneous and the alternative is heterogeneous.

In order to estimate the long-term causality relationship between series, it is tested whether the cointegration relationship exists between the two series. In case of cross-sectional dependency, as in unit root tests, first generation cointegration tests are weak in the cointegration test to test whether there is a long-term relationship between the two series or not. In this context, the second generation cointegration test, the Westerlund Panel Cointegration test, is obtained with the robust critical values of the bootstrap. This test includes 4 statistics based on group averages and panel statistics. The zero hypothesis is that there is no cointegration (Westerlund & Edgerton, 2007).

The long-term causality relationship between series is examined by Canning and Pedroni (2008) causality analysis. The advantage of this test is that it also signs the causality relationship between the series. In the first stage of the implementation of causality, the co-integrated relationship is predicted and in the second stage the error correction model is estimated. In the error correction model, the parameters $\lambda_1$ and $\lambda_2$, which are coefficients of the error term, are different from zero, showing the long-term relationship. The causality relationship for the panel is calculated by the logarithm of probability values ($p$) of each country and is called Lambda Pearson statistic and is calculated as follows:

$$P_{\lambda_2} = -2 \sum_{i=1}^{N} \ln P_{\lambda_{2i}}$$  \hspace{1cm} (5)

The null hypothesis of Lambda – Pearson statistic is $\lambda_{2i} = 0$ and means that there is no long-term causality relationship. The sign of causality is determined by $-\lambda_2 / \lambda_1$ ratio (Canning ve Pedroni, 2008).
Results and Discussion

This study aims to determine the existence and direction of causality between international migration and poverty in EU countries between 1990 and 2015. First of all, the matrix of correlation between migration and poverty was looked at and found to be a weak negative correlation of 36% between poverty and migration (Table 1). However, the result obtained from the correlation matrix is symmetric and it can not determine the direction of the relationship. That is, it is not known whether this relationship is from migration to poverty or from poverty to migration. In this context, Canning and Pedroni, which provide the sign of causality together with the direction of causality, are used to determine the long-term relationship. At the same time, this test results for each country as well as the overall panel, in other words, the heterogeneous panel causality test.

Table 1. The correlation matrix for migration and poverty

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Poverty</th>
<th>Migration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty</td>
<td>1.0000</td>
<td>-0.366163* (0.00000)</td>
</tr>
<tr>
<td>Migration</td>
<td>-0.366163* (0.00000)</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Note: the probability values are shown in the parenthesis. * represents the level of significance for 1%.

Some preliminary tests are needed before going to causality analysis. One of these preliminary tests is the homogeneity test. The test results of whether the panel is homogeneous are given in Table 2. According to the test results, the hypothesis is rejected. In this case, it is determined that the panel is heterogeneous, which is not homogeneous. In other words, it can be said that the slope coefficients vary from country to country.

Table 2. Homogeneity Test Results

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta tilde</td>
<td>12.789</td>
<td>0.000</td>
</tr>
<tr>
<td>Delta tilde adj.</td>
<td>13.565</td>
<td>0.000</td>
</tr>
</tbody>
</table>

It is determined that there is cross sectional dependency for both poverty and migration, based on the results of the cross sectional dependency used in determining whether a shock in a country affects other countries. It is impossible for a situation in a country such as migration to reflect a mutual situation to affect other countries. The presence of cross-sectional dependency is important in terms of unit root tests. Because, if cross-sectional dependency exists, first generation unit root tests are weak and second generation unit root tests are needed. According to the
THE SIGN OF PANEL LONG-RUN CAUSALITY ANALYSIS BETWEEN MIGRATION AND POVERTY: THE CASE OF EUROPE

Reyhan CAFRI

CADF test, which is one of the second generation unit root tests, it is seen that both the poverty and the migration variable become stationary after the first difference is taken (Table 3).

<table>
<thead>
<tr>
<th>Cross-Section Dep.</th>
<th>CADF Unit Root Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>CDLM stat.</td>
</tr>
<tr>
<td>Poverty</td>
<td>98.536*** (0.000)</td>
</tr>
<tr>
<td>Migrant</td>
<td>2.202** (0.028)</td>
</tr>
</tbody>
</table>

Note: The probability values are in parentheses. *, **, *** refer to a significance level of 10, 5 and 1%, respectively.

According to the CADF unit root test, it seems that the first difference of the series becomes stationary after receiving the first difference. In this context, it is necessary to test whether these series have acted together in the long run, that is, co-integrated. When we look at the robust p-values obtained by bootstrap, which are valid under cross-sectional dependency, the null hypothesis that there is no cointegration according to both group and panel statistics is rejected and it is concluded that there is cointegration relationship between series (Table 4).

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>Z-value</th>
<th>P-value</th>
<th>Robust P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gt</td>
<td>-3.452</td>
<td>-10.051</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Ga</td>
<td>-13.018</td>
<td>-5.780</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Pt</td>
<td>-19.844</td>
<td>-11.750</td>
<td>0.000</td>
<td>0.010</td>
</tr>
<tr>
<td>Pa</td>
<td>-12.739</td>
<td>-9.838</td>
<td>0.000</td>
<td>0.020</td>
</tr>
</tbody>
</table>

After the cointegration analysis, there is a long-term relationship between migration and poverty. In this context, long-term causality analysis can be applied. According to the results of long-term causality analysis, Lambda Pearson statistics for the overall panel have a two-way causality from migration to poverty and from poverty to migration. Looking at the results of long-term causality for each of the countries, bi-directional causality is being tested for Austria. Looking at the ratio of $\lambda_2 / \lambda_3$, which is the sign of causality, it appears to be negative. In this case, it is concluded that poverty is reduced as immigration increases in Austria, but poverty is reduced as poverty increases, that is, poverty is a barrier to migration. The same results are obtained for Italy. There is a two-way and negative causal relationship between migration and poverty. In Belgium, Denmark, Estonia, Latvia, Lithuania and Poland, there is a negative causality from migration to poverty. This shows that poverty is declining in these countries as
migration increases. In countries with negative causality towards migration to poverty, migration may be said to be pro-poor. It is stated that the countries that support the pro-poor migration support the policies that encourage migration, reduce remittances cost and other costs for those who want to migrate, and also facilitate bureaucratic procedures (Hagen-Zanker et al., 2017). Croatia, Hungary and Spain also found statistically significant causality from migration to poverty, but the sign of causality is positive. In other words, poverty increases as migration increases in these countries. The countries where there is a one-way and negative causality from poverty to migration are Finland, Luxembourg, Malta, Sweden and United Kingdom; while the only country was Greece in which migration increased as poverty increased (positive sign causality from poverty to migration).

Table 5. Result of Canning and Pedroni Causality Analysis

<table>
<thead>
<tr>
<th>Country</th>
<th>migrant=&gt;poverty p-value</th>
<th>poverty=&gt;migrant p-value</th>
<th>Ratio(Y/X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>-0.031687*</td>
<td>0.085574</td>
<td>-1286.679</td>
</tr>
<tr>
<td>Belgium</td>
<td>-0.168683**</td>
<td>0.015478</td>
<td>-70.59569</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>-0.014015</td>
<td>0.522598</td>
<td>-2494.787</td>
</tr>
<tr>
<td>Croatia</td>
<td>-0.048903***</td>
<td>0.002708</td>
<td>269.5582</td>
</tr>
<tr>
<td>Cyprus</td>
<td>-0.050698</td>
<td>0.164882</td>
<td>65.84313</td>
</tr>
<tr>
<td>Czech R.</td>
<td>-0.032725</td>
<td>0.210927</td>
<td>-524.4609</td>
</tr>
<tr>
<td>Denmark</td>
<td>-0.040995*</td>
<td>0.061213</td>
<td>-164.2264</td>
</tr>
<tr>
<td>Estonia</td>
<td>-0.048180**</td>
<td>0.041097</td>
<td>-24.34862</td>
</tr>
<tr>
<td>Finland</td>
<td>-0.034286</td>
<td>0.344917</td>
<td>-215.3652</td>
</tr>
<tr>
<td>France</td>
<td>0.082908</td>
<td>0.294455</td>
<td>-189.3766</td>
</tr>
<tr>
<td>Germany</td>
<td>-0.027240</td>
<td>0.191768</td>
<td>-792.4158</td>
</tr>
<tr>
<td>Greece</td>
<td>-0.040350</td>
<td>0.308671</td>
<td>760.2165</td>
</tr>
<tr>
<td>Hungary</td>
<td>-0.077670***</td>
<td>0.002936</td>
<td>12.57102</td>
</tr>
<tr>
<td>Ireland</td>
<td>-0.050521</td>
<td>0.154918</td>
<td>185.3507</td>
</tr>
<tr>
<td>Italy</td>
<td>-0.066284***</td>
<td>0.005433</td>
<td>-1044.620</td>
</tr>
<tr>
<td>Latvia</td>
<td>-0.046222**</td>
<td>0.027203</td>
<td>-279.0014</td>
</tr>
<tr>
<td>Lithuania</td>
<td>-0.060070***</td>
<td>0.008396</td>
<td>-610.5996</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>-0.029223</td>
<td>0.362346</td>
<td>-1088.905</td>
</tr>
<tr>
<td>Malta</td>
<td>-0.016627</td>
<td>0.608643</td>
<td>-2457.555</td>
</tr>
<tr>
<td>Netherlands</td>
<td>-0.084868</td>
<td>0.130894</td>
<td>-12.90725</td>
</tr>
</tbody>
</table>
THE SIGN OF PANEL LONG-RUN CAUSALITY ANALYSIS BETWEEN MIGRATION AND POVERTY: 
THE CASE OF EUROPE

Reyhan CAFRI

<table>
<thead>
<tr>
<th>Country</th>
<th>migrant=&gt;poverty</th>
<th>p-value</th>
<th>poverty=&gt;migrant</th>
<th>p-value</th>
<th>Ratio(Y/X)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lamda1</td>
<td></td>
<td>Lamda2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slovak R.</td>
<td>-0.006281</td>
<td>0.759553</td>
<td>-6.900963</td>
<td>0.328869</td>
<td>-1098.772</td>
</tr>
<tr>
<td>Slovenia</td>
<td>-0.025680</td>
<td>0.328713</td>
<td>-18.98315</td>
<td>0.393459</td>
<td>-739.2305</td>
</tr>
<tr>
<td>Spain</td>
<td>-0.040252**</td>
<td>0.012860</td>
<td>22.34713</td>
<td>0.466937</td>
<td>555.1849</td>
</tr>
<tr>
<td>Sweden</td>
<td>-0.089128</td>
<td>0.105406</td>
<td>-62.14406**</td>
<td>0.019510</td>
<td>-697.2445</td>
</tr>
<tr>
<td>Turkey</td>
<td>-0.022981</td>
<td>0.326616</td>
<td>-47.00207</td>
<td>0.544928</td>
<td>-2045.235</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>-0.027037</td>
<td>0.631016</td>
<td>-20.89938**</td>
<td>0.026660</td>
<td>-772.9810</td>
</tr>
</tbody>
</table>

Panel results

<table>
<thead>
<tr>
<th>migrant=&gt;poverty</th>
<th>Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamda - Pearson</td>
<td>135.6980***</td>
<td>3.60E-08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>poverty=&gt;migrant</th>
<th>Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamda - Pearson</td>
<td>79.91990**</td>
<td>0.029784</td>
</tr>
</tbody>
</table>

Note: *, **, *** refer to a significance level of 10, 5 and 1%, respectively.

Conclusion

In this study, which explores both the direction and sign of migration and poverty interaction, the findings suggest that there is a two-way causality between poverty and migration for the panel in EU countries and Turkey between 1990 and 2015. In other words, from poverty to migration and from migration to poverty, a finding of causality was obtained. Looking at the results of causality for each country, it is seen that the results are different in the country. For Austria and Italy, both from poverty to migration and from migration to poverty, two-way causality has been identified. The sign of this causality is negative for both countries. Negative causality means that migration decreases as poverty increases and poverty decreases as migration increases. In Belgium, Denmark, Estonia, Latvia, Lithuania and Poland, there is a negative causation from migration to poverty. In this case, poverty decreases as migration increases in these countries, or poverty increases as migration decreases. For Croatia, Hungary and Spain, there was a positive causation from migration to poverty. For Croatia, Hungary and Spain, there was a positive causation from migration to poverty. In this case, it is thought that the increase in migration in these countries also increases poverty, or that the decline in migration reduces poverty. According to this result, these countries cannot absorb migration can be said. In Finland, Luxembourg, Malta, Sweden and United Kingdom, there is a negative causation from poverty to migration. For Finland, Luxembourg, Malta, Sweden and United Kingdom, there is a negative causation from poverty to migration. In these countries with relatively high levels
of welfare, it is thought that the "stay at home" policy is being applied and encouraged to the poor. In Greece, there is a positive causality from poverty to migration. This result shows that migration increases as poverty increases, or migration decreases as poverty decreases. As a result of the decrease in welfare level in Greece, which has recently come up with crises, people can be considered to be looking for the solution in other countries. That is, the increase of poverty leads to the increase in immigration. In other words, the decrease in poverty depends on the increase in migration. Although millions of Syrian immigrants have come to Turkey in recent years, it is interesting that there is no statistically significant long-term causality between migration and poverty. However, given the time period of analysis, while Turkey a country that was migrating to other countries in the 1990s, became a country that got an immigrant from abroad intensively as of 2011. For this reason, the long-term causality between migration and poverty is thought to be statistically insignificant in Turkey.
References


Introduction

Turkey is the 18th largest economy in the World according to the data from IMF in 2015, 2016, and 2017. The goal of Turkey for 2023 is being in the top ten economies worldwide. In respect to the UN Comtrade total export data in 2014, 2015, and 2016, Turkey is 31st in the list of the most-exporting countries. In 2016, Turkey’s total export was 143 billion dollars, and it is aimed to be reached 500 billion dollars in 2023. It can be readily seen that Turkey’s export target for 2023 seems incredibly high and unlikely to make real. Among others, the main reason why Turkey might not reach the goal is Turkey has competitiveness in labour-intensive sectors based mainly on unskilled labours. Thus, it leads to export of low-value-added products. It can be observed that, however, the countries having a significant share in the world export have competitiveness mostly in high-value-added, easy and hard to imitate researched-based products. There are two ways to deal with this obstacle Turkey faces in its export structure. The first way is that Turkey should switch its production factors from labour-intensive sectors to high-value-added sectors that produce research-based products, but this option is only possible with long-term planning. The second one is developing and supporting the current structure of labour-intensive industries to increase labour productivity, investing more in R&D and marketing, finding new markets, providing a field for university-industry collaborations. Besides that, the last but not the least important, knowing its rivals very well and make its move accordingly can be the essential elements to increase its visibility in the export performance globally.

In this work, some analyses have been made to know Turkey’s the potential competitors in exports as well as their export structure and performance. What benefits will it have? When considering country-based, production is shaped by the intensity of technology used, and the

---

* Kilis 7 Aralik University, kazimsaricoban@hotmail.com
** Kilis 7 Aralik University, elif.7@hotmail.com
search for such a market is done accordingly. For this reason, countries with the same technology intensity will face each other as competitors in the market, as they will produce products with the same technology. At this point, one of the factors that influence countries’ market success in exports is to identify the right competitors and make the right moves. In this paper, firstly Turkey’s potential competitors are identified, then various analyses are carried out to see the sectors they have advantageous/disadvantageous, and finally, Turkey and these countries are compared and contrasted.

To do this, in the first place, it is determined which sectors Turkey has competitiveness in by the technology density. According to the results, Turkey has a competitive advantage on labour-intensive and capital-intensive goods exports on a global scale. Secondly, in the exports of these sectors in 2014, 2015 and 2016, the top 15 exporting countries in the world were identified. Finally, we try to find an answer for the following questions. Do countries with the lion’s share in the exports of these sectors also have a competitive advantage in these sectors for real? In other words, are these countries the rival of Turkey?

To answer those questions, in the first place, a comparison between Turkey and the countries regarding exported goods similarity is made, and it is determined how much Turkey and its rivals show proportional similarities in these goods’ exports is determined. Accordingly, the most serious rival of Turkey’s exports of labour-intensive goods is China, Vietnam and India while the most serious competitors in the exports of capital-intensive goods are Japan, Spain, the Czech Republic and Germany. Secondly, the selected countries are subjected to the analysis according to SITC technology intensity, and the results are summarized in a table. Lastly, Turkey and these countries sectoral competitiveness are comparatively interpreted.

Literature Review

In their paper, Balassa and Noland (1989) have examined the changes in comparative advantages of America and Japan for the period 1967-1983. In the study which Balassa Index and Net Trade Index are used in, 57 essential goods groups, as well as 167 manufacturing industries and 20 advanced technology goods groups, were included in the analysis. In compliance with the findings of the study, the level of specialisation in Japan has shifted from unqualified labour-intensive products to qualified labour-intensive products. At the same period, Japan has a disadvantage in exports of raw material intensive goods; The United States, on the other hand, has a comparative advantage in raw material intensive and qualified labour-intensive products. Both countries have increased their comparative advantage in high-tech products.

Yilmaz (2003) has aimed to make a comparison between the EU-15 and the five EU candidate countries (Bulgaria, Hungary, Romania, Poland and the Czech Republic) between 1996 and 1999 by using the Balassa Index, Comparative Export Performance and Export Similarity
Index. In the same paper, he has also examined the international competitiveness of Turkey’s economy and the level of its specialisation in foreign trade. He finds that Hungary has an advantage only in raw material intensive goods; Turkey, Czechia, Romania and partly Bulgaria have an advantage in the export of labour-intensive goods while Czechia has the highest RCA value in capital-intensive goods and Hungary has the highest RCA values on the research-based goods. Moreover, Turkey has high RCA values in exports of raw materials and labour-intensive goods.

Yılmaz and Ergün (2003), make a comparison between the six EU candidate countries (Turkey, Bulgaria, Hungary, Romania, Poland and the Czech Republic) and the EU-15 countries from 1999 to 2002. According to the results of work in which a variety of RCA index is used, it is observed that Turkey, the Czechia, Romania and Bulgaria have competitiveness in part in the exports of labour-intensive goods; Czechia, Bulgaria and partly Romania have competitiveness in the exports of capital-intensive goods. It has also been determined that the six EU candidate countries have comparative disadvantages in exporting research-based goods that are easy and difficult to imitate and that the EU-15 countries have competitiveness in exports of capital-intensive and difficult-to-imitate research-based goods. Turkey has a substantial comparative advantage in the exports of the raw material-intensive and labour-intensive products.

Kosekahyaoglu (2003) analyses Turkey’s comparative advantage to the EU in sector-based structure, and he examines if there is a change in the comparative advantage after 1980 when Turkey’s free-trade period has begun. According to the results of the research in which Import Export Rate Index is used, it is determined that there has been a fall of competitiveness in some traditional labour-intensive industries especially after the 1980s with the implementing of liberal policies in Turkey. The author emphasised that the reason for this decline may be wage increases in traditional labour-intensive industries due to the rise in labour demand. Also, he suggests that Turkey should support not only the exports of technology-intensive products but also the exports of traditional labour-intensive products.

Erlat and Erlat (2005) tried to identify Turkey’s export competitiveness across the EU-15 by using the data for the period of 1990-2000 and the Balassa Index. In respect to the study results, Turkey has competitiveness on the export of raw materials and labour-intensive goods but has disadvantage in the export of easy- or hard-to-imitated research-based goods. Also, in the EU-15 countries, Belgium, Denmark, Finland, Spain and Greece have been identified as having similar performance with Turkey.

Simsek, Seymen, and Utkulu (2007) analysed the competitiveness of Turkish firms in the EU market with different RCA measures. For the analyses, data is chosen from 1993 to 2006, and SITC Rev. 3 is used. In conclusion, Turkey’s competitiveness is in the exports of raw materials and labour intensive of goods, and it has a partial competitive advantage in the exports of capital-intensive goods, but it has been found to be disadvantageous in exports of research-based goods.
Erkan’s (2011) study, uses the Balassa index and demonstrates the sectoral competitiveness of Turkey and N-11 countries. Foreign trade data is used between 1993 and 2009 in the study. According to the results, it is seen that Turkey has a comparative advantage in labour and capital-intensive goods. The sectors with the highest RCA values of N-11 countries are raw materials and labour-intensive industries.

Erkan and Sarıçoban (2014) in their study using a variety of RCA indexes try to determine the export competitiveness of Turkey and the European Union together with the subsequently joined 13 countries (EU+13). In the study, in which the SITC technology classification is used, analyses are made between 1993 and 2012. According to their findings, technology-intensive goods has seen to have a significant effect in order to increase the export share of Turkey and EU+13 countries in the world trade. It is also witnessed that the EU+13 countries have started to increase their export competitiveness after becoming members of the EU. Also, Turkey’s export competitiveness has been observed to be lower than EU+13 countries.

Data and Methodology

Export data used in the paper base on the SITC Rev. 3 (Standard International Trade Classification) classification in Comtrade (https://comtrade.un.org). The SITC technology classification used at the beginning of the study divides the product groups into five classes according to the technology used in goods production. The data are organized according to these classifications as well as analyses are made by using them. The product groups and codes are as follows (Hufbauer & Chilas, 1974):

Raw Material Intense (RMI): SITC 0, 23, 24, 25, 27, 28, 29, 22, 21, 32, 33, 34, 4, 56
Labour Intense (LI): SITC 26, 61, 63, 64, 65, 66, 69, 81, 82, 83, 84, 85, 89
Capital Intense (CI): SITC 1, 35, 53, 55, 62, 67, 68, 78
Easy-to-Imitate (ETI): SITC 51, 52, 54, 58, 59, 75, 76
Hard-to-Imitate (HTI): SITC 57, 71, 72, 73, 74, 77, 79, 87, 88

One of the methods employed in the research is the Export Similarity Index (ESI), which is used to measure the export similarity of countries. The ESI is an index used to measure the similarity of exported goods/products between countries or a group of countries. The ESI is not affected by the total amount of exports, it is only comparing the exported goods (Finger & Kreinin, 1979, pp. 905-906). In short, the calculated ESI value gives the similarity of the proportional distribution of the exports to the groups of goods. This is important to allow for the comparison of the export structure of a small country with a large country group (Akgüngör, Barbaros, & Kumral, 2001, p. 27). The ESI index is as follows (Finger & Creinin, 1979, pp. 905-906):
ESI= \sum \min [X_k(jw), X_k(mw)] \times 100 \tag{1}

\( X_k(jw) \) is used to calculate the share of the total export of ‘k’ good in the total exports of country j while \( X_k(mw) \) is used to calculate the share of the total export of ‘k’ good in the total exports of country m. In the formula, firstly, the export of good k shares in the total export of each country is calculated, then taking the minimums for both j and m countries to compare these two. And finally, the similarity ratio is reached by accumulating each calculated ratio for every good.

The ESI index takes values between “0” and “100”. The index value of “0” means that exported goods by the two countries are different. Thus, it can be said that there is no export similarity. In other words, the two countries are not in competition. On the other hand, if the ESI value is “100”, it means there is a full export similarity. In such a case, the exported goods of both countries are identical, and the two countries are in full competition (Finger & Kreinin, 1979, p. 906).

In the paper, the Revealed Comparative Advantages method is adopted for the analysis of data, and the analyses are done by Vollrath’s (1991) Relative Export Advantage Index. The index, that is based on the index developed by Bela Balassa (1965), is distinguished from the Balassa Index at the point of double counting of the country and the goods, thus it is considered to give more reliable results. The index is also useful in determining whether a country has a comparative advantage over a particular product or group of products, rather than the factors that determine or influence comparative advantages. The index can be briefly defined as the comparison of the specialisation of a country domestically (the share of the RCA index) in a good or sector with that of the world (or country group) (Beningo, 2005, p. 6). The index formula is as follows (Vollrath, 1991, pp. 265-280):

\[
\text{RCA}_{j}^{kt} = \frac{X_{j}^{kt}/X_{kt}}{X_{kt}/X_{j}} \tag{2}
\]

Where \( X_{j}^{kt} \) is the total export of ‘k’ good of the country ‘j’ in period ‘t’ while \( X_{kt} \) is stand for total export of all goods except ‘k’ of the country ‘j’ in the period ‘t’. \( X_{kt}^{j} \) shows the total exports of ‘k’ good in the period ‘t’ worldwide whilst \( X_{kt}^{j} \) is total world export except \( X_{kt}^{j} \). \( \text{RCA}_{j}^{kt} \geq 1 \) indicates that the country has a competitive advantage on a global scale while \( 0 < \text{RCA}_{j}^{kt} < 1 \) indicates a competitive disadvantage.

**Turkey’s Export Competitiveness According To Technology Intensity**

Turkey’s technology classification analysis is made by considering the years between 2007 and 2016. This classification of exported goods consists of groups of goods which are raw-material intensive, labour intensive, capital intensive, easy-to-imitate and hard-to-imitate.
With respect to the results obtained from the analysis by Vollrath (1991) Relative Export Advantage, trimmed mean RCA values show that Turkey has a comparative advantage only in the export of labour and capital-intensive goods.

### Table 1: Turkey’s RCA Values by Technology Intensity

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RMI</td>
<td>0.60</td>
<td>0.51</td>
<td>0.59</td>
<td>0.59</td>
<td>0.57</td>
<td>0.53</td>
<td>0.58</td>
<td>0.66</td>
<td>0.73</td>
<td>0.73</td>
<td>0.57</td>
<td>0.65</td>
<td>0.61</td>
</tr>
<tr>
<td>LI</td>
<td>2.77</td>
<td>2.51</td>
<td>2.60</td>
<td>2.83</td>
<td>2.76</td>
<td>2.52</td>
<td>2.85</td>
<td>2.82</td>
<td>2.54</td>
<td>2.52</td>
<td>2.69</td>
<td>2.65</td>
<td>2.67</td>
</tr>
<tr>
<td>CI</td>
<td>1.91</td>
<td>2.33</td>
<td>2.08</td>
<td>2.07</td>
<td>2.07</td>
<td>1.77</td>
<td>1.87</td>
<td>1.73</td>
<td>1.64</td>
<td>1.73</td>
<td>2.09</td>
<td>1.75</td>
<td>1.90</td>
</tr>
<tr>
<td>ETI</td>
<td>0.28</td>
<td>0.25</td>
<td>0.24</td>
<td>0.27</td>
<td>0.28</td>
<td>0.28</td>
<td>0.28</td>
<td>0.28</td>
<td>0.27</td>
<td>0.25</td>
<td>0.27</td>
<td>0.27</td>
<td>0.27</td>
</tr>
<tr>
<td>HTI</td>
<td>0.56</td>
<td>0.58</td>
<td>0.58</td>
<td>0.57</td>
<td>0.62</td>
<td>0.55</td>
<td>0.62</td>
<td>0.58</td>
<td>0.53</td>
<td>0.51</td>
<td>0.58</td>
<td>0.56</td>
<td>0.57</td>
</tr>
</tbody>
</table>

When the results are analysed according to the periods, it is seen that the RCA value for first period (2007-2011) which is 2.69 in the labour-intensive sector decreased to 2.65 in the second period (2012-2016). Likewise, the first-period RCA value of capital-intensive goods is 2.09, while the value dropped to 1.75 in the second period. Also, the competitive disadvantage in the easy- and hard-to-imitate goods’ export seems to be stable in both periods. By the RCA value of raw material intensive goods, there is only a little increase in the second term, and it is also a disadvantageous sector as RCA value is smaller than 1.

To sum up, it is determined that Turkey has a competitive advantage in the exports of labour-intensive and capital-intensive goods for 10-years period compared to the world. Having known about sectors that Turkey is advantageous in; now it should be established which countries have the lion’s share in quantitative terms in the exports of labour-intensive and capital-intensive goods? And in which sectors do these countries have a competitive advantage in terms of technology classifications? Subsequent analyses are based on this.

### The Countries in The List Of Export of Labour And Capital Intensive Goods in The World and Their Export Similarity with Turkey

In this section, firstly the countries in the top of the list in exports of labour intensive and capital intensive goods in 2014, 2015 and 2016 is determined. Then, the labour and capital intensive exports of these countries and that of Turkey are compared to find the similarity between them by applying the Export Similarity Index, and results are interpreted.
The First 15 Countries in The Export of Labour Intensive Goods Worldwide and Their Export Similarities with Turkey

In table 2, the export values of the first 15 countries are given sequentially in terms of labour-intensive sectors by years. According to the table, China exports the most in the labour-intensive industries worldwide every single year. In 2014, Germany, the United States, Italy and India followed the country, respectively. Turkey is the 11th most exporting countries in the labour-intensive industries in the world in 2014.

<table>
<thead>
<tr>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 China</td>
<td>827,369,874.632</td>
<td>China</td>
</tr>
<tr>
<td>2 Germany</td>
<td>207,244,772.494</td>
<td>USA</td>
</tr>
<tr>
<td>3 USA</td>
<td>198,543,602.540</td>
<td>Germany</td>
</tr>
<tr>
<td>4 Italy</td>
<td>144,779,255.740</td>
<td>Italy</td>
</tr>
<tr>
<td>5 India</td>
<td>100,786,704.699</td>
<td>India</td>
</tr>
<tr>
<td>6 Hong Kong</td>
<td>100,025,336.518</td>
<td>Hong Kong</td>
</tr>
<tr>
<td>7 France</td>
<td>82,958,540.704</td>
<td>France</td>
</tr>
<tr>
<td>8 Belgium</td>
<td>80,162,156.875</td>
<td>Belgium</td>
</tr>
<tr>
<td>9 United Kingdom</td>
<td>68,825,088.368</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>10 Netherlands</td>
<td>66,704,887.053</td>
<td>Vietnam</td>
</tr>
<tr>
<td>11 Turkey</td>
<td>55,636,608.466</td>
<td>Netherlands</td>
</tr>
<tr>
<td>12 Spain</td>
<td>55,547,001.930</td>
<td>Spain</td>
</tr>
<tr>
<td>13 Vietnam</td>
<td>53,998,045.272</td>
<td>Turkey</td>
</tr>
<tr>
<td>14 Poland</td>
<td>52,782,526.886</td>
<td>Poland</td>
</tr>
<tr>
<td>15 South Korea</td>
<td>45,293,426.818</td>
<td>South Korea</td>
</tr>
</tbody>
</table>

Source: It is prepared by authors by using the data from https://comtrade.un.org/ (Accessed 04.04.2018).

In 2015, China is followed by the USA, Germany, Italy and India, respectively. In the exports of labour-intensive sectors in 2015, Turkey is the 13th. By the year 2016, China is again followed by the USA, Germany, Italy and India, respectively. In the export of labour-intensive goods in 2016, Turkey ranks 14th.

As it can be seen, the first 15 countries in the last three years have not changed at all. However, their rank has changed. So, what is the state of similarity between Turkey and these countries in terms of exports in labour-intensive sectors? Let us have a look at it now.
As Turkey is in the first fifteen, the similarity to Turkey is calculated for the remaining 14 countries by using the Export Similarity Index. Accordingly, for the 14 countries in the world ranking in labour-intensive sectors similarity with Turkey's export structure is shown in the chart below.

For the exports of labour-intensive goods in 2014, the figure shows that Turkey is similar with China by 79%, Spain by 76%, Italy by 74%, South Korea by 71%, and India 69%. Turkey, however, for the same period, has the least similarity with the United States and Hong Kong. In 2015, Turkey's highest export similarity is with China by 80%. This country is followed by Spain (77%) and Italy (73%). In 2016, the first competitor and the ratio has not changed, it is seen the most similar country is again China with 80 per cent.

The First 14 Countries in The Export of Capital-Intensive Goods Worldwide and Their Export Similarities with Turkey

In the table, the export values of the first 14 countries in the capital-intensive sectors are given sequentially. Turkey ranks 19th on the list. It can be seen from the table that the most exports in the capital-intensive industries all over the world are realized by Germany in all three years. In 2014, this country is followed by the USA, China, Japan and South Korea respectively.
Table 3: The First 14 Countries in Capital Intensive Goods Exports (The US Dollars)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Germany</td>
<td>373.318.967.050</td>
<td>338.513.083.644</td>
</tr>
<tr>
<td>2</td>
<td>USA</td>
<td>214.306.308.085</td>
<td>199.082.809.638</td>
</tr>
<tr>
<td>3</td>
<td>China</td>
<td>209.098.954.687</td>
<td>192.776.927.899</td>
</tr>
<tr>
<td>4</td>
<td>Japan</td>
<td>208.484.096.137</td>
<td>189.798.448.726</td>
</tr>
<tr>
<td>5</td>
<td>South Korea</td>
<td>123.864.651.950</td>
<td>113.432.526.526</td>
</tr>
<tr>
<td>6</td>
<td>France</td>
<td>118.609.970.880</td>
<td>106.327.270.667</td>
</tr>
<tr>
<td>7</td>
<td>Mexico</td>
<td>106.327.270.667</td>
<td>105.685.128.268</td>
</tr>
<tr>
<td>8</td>
<td>United Kingdom</td>
<td>99.787.584.463</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>9</td>
<td>Canada</td>
<td>93.480.945.676</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>10</td>
<td>Italy</td>
<td>90.856.828.422</td>
<td>Italy</td>
</tr>
<tr>
<td>11</td>
<td>Spain</td>
<td>87.400.762.671</td>
<td>Spain</td>
</tr>
<tr>
<td>12</td>
<td>Belgium</td>
<td>86.955.613.331</td>
<td>Belgium</td>
</tr>
<tr>
<td>13</td>
<td>Netherlands</td>
<td>61.372.981.707</td>
<td>Netherlands</td>
</tr>
<tr>
<td>14</td>
<td>Czechia</td>
<td>48.254.944.781</td>
<td>Czechia</td>
</tr>
<tr>
<td>19</td>
<td><strong>Turkey</strong></td>
<td>37.381.694.938</td>
<td><strong>Turkey</strong></td>
</tr>
</tbody>
</table>

**Source:** It is prepared by authors by using the data from https://comtrade.un.org/ (Accessed: 04.04.2018).

In 2015, the first five of the rank of exports of capital-intensive goods has not changed. Turkey has ranked 19th on the list again. By the year 2016, in the export of capital-intensive goods, Germany is followed by Japan, the United States, China and Mexico. Turkey has maintained its position again in the 19th.

As demonstrated in the table, the first 14 countries on the list have not changed at all in the three years; there are some changes in the ranking. So what is the state of similarity in Turkey’s exports of capital-intensive goods with these countries? Let us elaborate on it now.

In examining labour-intensive sectors, it is again analysed by using the Export Similarity Index to see Turkey’s similarity with the fourteen countries. Turkey’s export similarity with the 14 countries in capital-intensive goods exports is shown in the chart below.
THE SECTORS TURKEY HAS COMPARATIVE ADVANTAGES IN EXPORTS, POTENTIAL COMPETITORS IN THIS SECTORS AND COMPARATIVE ANALYSIS TO THEM

Kazim SARICOBAN, Elif KAYA

Graph 2: Turkey’s Export Similarity with the Chosen Countries in Capital Intensive Sectors (2014-2016)

According to the figure, the export similarity of Turkey’s exports of capital-intensive goods in 2014 is the highest in Belgium with 87 per cent. This country is followed by South Korea and Italy by 86% and China by 84%. In 2015, the export similarity of Turkey is still the highest in Belgium with 91 per cent. The country is followed by South Korea with 90%, Italy by 88% and Spain by 84%. By 2016, Turkey’s exports show the highest similarity with South Korea with 95 per cent as it is seen in the chart. This country is followed by Belgium with 92%, Spain by 86%, Italy and USA by 85%.

An Analysis Of Turkey’s Potential Competitors By SITC Classification in The Exports Of Labour And Capital Intensive Goods

In this section, we chose the most similar countries with Turkey from the countries having a lion share in the labour-intensive and capital-intensive merchandise exports that we have analysed before to determine Turkey’s potential competitors in the industries in order to assess their export competitiveness in terms of their technology intensity. For this reason, the countries to be used for analysis are identified first, and then the RCA coefficients of them are calculated according to the SITC technology classification.

Turkey’s Possible Competitors in Exports

The countries have the highest export similarity rate with Turkey in labour-intensive and capital-intensive industries are as follows:
Table 4: Turkey’s Similarity with the Chosen Countries

<table>
<thead>
<tr>
<th>The Similarity in Labour Intensive (%)</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China 79</td>
<td>China 80</td>
<td>China 80</td>
</tr>
<tr>
<td>2</td>
<td>Spain 76</td>
<td>Spain 77</td>
<td>Spain 77</td>
</tr>
<tr>
<td>3</td>
<td>Italy 74</td>
<td>Italy 73</td>
<td>Italy 73</td>
</tr>
<tr>
<td>4</td>
<td>South Korea 71</td>
<td>India 72</td>
<td>South Korea 70</td>
</tr>
<tr>
<td>5</td>
<td>India 69</td>
<td>South Korea 70</td>
<td>India 69</td>
</tr>
<tr>
<td>6</td>
<td>Netherland 67</td>
<td>France 67</td>
<td>France 66</td>
</tr>
<tr>
<td>7</td>
<td>France 66</td>
<td>Netherland 66</td>
<td>Netherland 66</td>
</tr>
<tr>
<td>8</td>
<td>Vietnam 65</td>
<td>Vietnam 65</td>
<td>Vietnam 66</td>
</tr>
<tr>
<td>9</td>
<td>Germany 64</td>
<td>Germany 64</td>
<td>United Kingdom 64</td>
</tr>
<tr>
<td>10</td>
<td>United Kingdom 64</td>
<td>United Kingdom 63</td>
<td>Germany 63</td>
</tr>
<tr>
<td>11</td>
<td>Poland 60</td>
<td>Belgium 61</td>
<td>Belgium 62</td>
</tr>
<tr>
<td>12</td>
<td>Belgium 60</td>
<td>Poland 61</td>
<td>Poland 61</td>
</tr>
<tr>
<td>13</td>
<td>Hong Kong 59</td>
<td>Hong Kong 59</td>
<td>Hong Kong 56</td>
</tr>
<tr>
<td>14</td>
<td>USA 55</td>
<td>USA 56</td>
<td>USA 55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The Similarity in Capital Intensive (%)</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Belgium 87</td>
<td>Belgium 91</td>
<td>South Korea 95</td>
</tr>
<tr>
<td>2</td>
<td>South Korea 86</td>
<td>South Korea 90</td>
<td>Belgium 92</td>
</tr>
<tr>
<td>3</td>
<td>Italy 86</td>
<td>Italy 88</td>
<td>Spain 86</td>
</tr>
<tr>
<td>4</td>
<td>China 84</td>
<td>Spain 84</td>
<td>Italy 85</td>
</tr>
<tr>
<td>5</td>
<td>Spain 82</td>
<td>USA 83</td>
<td>USA 85</td>
</tr>
<tr>
<td>6</td>
<td>Japan 79</td>
<td>Japan 82</td>
<td>Japan 83</td>
</tr>
<tr>
<td>7</td>
<td>USA 79</td>
<td>China 81</td>
<td>Germany 83</td>
</tr>
<tr>
<td>8</td>
<td>United Kingdom 77</td>
<td>United Kingdom 80</td>
<td>United Kingdom 81</td>
</tr>
<tr>
<td>9</td>
<td>Netherland 77</td>
<td>Germany 79</td>
<td>Czechia 80</td>
</tr>
<tr>
<td>10</td>
<td>Germany 76</td>
<td>Netherland 78</td>
<td>Netherlands 78</td>
</tr>
<tr>
<td>11</td>
<td>Czechia 75</td>
<td>Czechia 77</td>
<td>China 78</td>
</tr>
<tr>
<td>12</td>
<td>France 74</td>
<td>France 74</td>
<td>Canada 77</td>
</tr>
<tr>
<td>13</td>
<td>Canada 70</td>
<td>Canada 74</td>
<td>France 73</td>
</tr>
<tr>
<td>14</td>
<td>Mexico 66</td>
<td>Mexico 68</td>
<td>Mexico 73</td>
</tr>
</tbody>
</table>

Turkey’s exports of similarity in both sectors are the highest in the country are included in the analysis at the next stage. According to the table, these countries are China, Spain, Italy, South
Korea, India, Belgium, USA, Hong Kong, France, Mexico, England, Netherlands, Vietnam, Poland, Canada, Germany, Czech Republic and Japan (totally 18 countries). When we include Turkey, the analysis is made to 19 countries. In the next section, the export competitiveness of the countries according to the technological intensities is determined for five groups; namely, raw materials intensive, labour intensive, capital intensive, easy-to-imitate and hard-to-imitate goods exports.

**Determination of RCA Coefficients According to Technology Intensity of Countries**

In this part, the export competitiveness of Turkey’s potential competitors in the export of labour-intensive and capital-intensive goods are calculated separately according to SITC classification into five categories. To this end, export data for each classification is used for all countries between 2007 and 2016, and RCA coefficients are calculated by analysing these data with Vollrath’s (1991) Relative Export Advantage Index. RCA values are shown for each year as well as the trimmed mean\(^1\) of the whole 2007-2016 period is shown in a separate column. Thus, overall comments are made over the mean RCA values.

\(^{1}\) Trimmed mean: It is calculated by taking out of the highest and smallest numbers from the data before calculated the arithmetic mean.
<table>
<thead>
<tr>
<th>Country</th>
<th>RMI</th>
<th>LI</th>
<th>CI</th>
<th>ETI</th>
<th>HTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Korea</td>
<td>0.32</td>
<td>0.48</td>
<td>1.33</td>
<td>1.52</td>
<td>2.02</td>
</tr>
<tr>
<td></td>
<td>0.35</td>
<td>0.48</td>
<td>1.34</td>
<td>1.44</td>
<td>2.26</td>
</tr>
<tr>
<td></td>
<td>0.30</td>
<td>0.46</td>
<td>1.32</td>
<td>1.24</td>
<td>2.68</td>
</tr>
<tr>
<td></td>
<td>0.29</td>
<td>0.43</td>
<td>1.43</td>
<td>1.32</td>
<td>2.77</td>
</tr>
<tr>
<td></td>
<td>0.36</td>
<td>0.44</td>
<td>1.54</td>
<td>1.43</td>
<td>2.62</td>
</tr>
<tr>
<td></td>
<td>0.38</td>
<td>0.47</td>
<td>1.62</td>
<td>1.62</td>
<td>2.53</td>
</tr>
<tr>
<td></td>
<td>0.35</td>
<td>0.45</td>
<td>1.62</td>
<td>1.62</td>
<td>2.47</td>
</tr>
<tr>
<td></td>
<td>0.39</td>
<td>0.42</td>
<td>1.54</td>
<td>1.54</td>
<td>2.58</td>
</tr>
<tr>
<td></td>
<td>0.33</td>
<td>0.45</td>
<td>1.50</td>
<td>1.50</td>
<td>2.53</td>
</tr>
<tr>
<td>India</td>
<td>1.62</td>
<td>2.95</td>
<td>0.72</td>
<td>0.56</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>1.42</td>
<td>2.58</td>
<td>0.80</td>
<td>0.62</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>1.15</td>
<td>3.04</td>
<td>0.76</td>
<td>0.64</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>1.32</td>
<td>2.77</td>
<td>0.94</td>
<td>0.64</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>1.24</td>
<td>2.88</td>
<td>0.76</td>
<td>0.72</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>1.38</td>
<td>2.81</td>
<td>0.77</td>
<td>0.68</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>1.14</td>
<td>2.51</td>
<td>0.78</td>
<td>0.60</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>1.38</td>
<td>2.42</td>
<td>0.83</td>
<td>0.70</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>1.62</td>
<td>2.64</td>
<td>0.83</td>
<td>0.73</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>1.28</td>
<td>2.84</td>
<td>0.83</td>
<td>0.73</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>1.30</td>
<td>2.75</td>
<td>0.83</td>
<td>0.73</td>
<td>0.38</td>
</tr>
<tr>
<td>Spain</td>
<td>0.83</td>
<td>1.11</td>
<td>0.72</td>
<td>0.56</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>0.77</td>
<td>1.18</td>
<td>0.80</td>
<td>0.62</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>0.87</td>
<td>1.14</td>
<td>0.76</td>
<td>0.64</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>0.83</td>
<td>1.14</td>
<td>0.94</td>
<td>0.64</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>0.82</td>
<td>1.10</td>
<td>0.76</td>
<td>0.72</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>0.90</td>
<td>0.77</td>
<td>0.68</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>0.83</td>
<td>1.09</td>
<td>0.78</td>
<td>0.60</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>1.01</td>
<td>1.10</td>
<td>0.83</td>
<td>0.70</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>1.09</td>
<td>1.11</td>
<td>1.00</td>
<td>0.73</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>1.17</td>
<td>1.11</td>
<td>1.17</td>
<td>0.68</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>0.89</td>
<td>1.11</td>
<td>1.17</td>
<td>0.63</td>
<td>0.70</td>
</tr>
<tr>
<td>Italy</td>
<td>0.38</td>
<td>2.15</td>
<td>0.49</td>
<td>0.49</td>
<td>1.45</td>
</tr>
<tr>
<td></td>
<td>0.35</td>
<td>2.20</td>
<td>0.52</td>
<td>0.52</td>
<td>1.56</td>
</tr>
<tr>
<td></td>
<td>0.40</td>
<td>2.05</td>
<td>0.59</td>
<td>0.59</td>
<td>1.54</td>
</tr>
<tr>
<td></td>
<td>0.41</td>
<td>2.10</td>
<td>0.62</td>
<td>0.62</td>
<td>1.45</td>
</tr>
<tr>
<td></td>
<td>0.37</td>
<td>2.06</td>
<td>0.57</td>
<td>0.57</td>
<td>1.45</td>
</tr>
<tr>
<td></td>
<td>0.39</td>
<td>2.02</td>
<td>0.58</td>
<td>0.58</td>
<td>1.43</td>
</tr>
<tr>
<td></td>
<td>0.36</td>
<td>2.06</td>
<td>0.58</td>
<td>0.58</td>
<td>1.43</td>
</tr>
<tr>
<td></td>
<td>0.41</td>
<td>1.96</td>
<td>0.54</td>
<td>0.54</td>
<td>1.42</td>
</tr>
<tr>
<td></td>
<td>0.47</td>
<td>1.82</td>
<td>0.54</td>
<td>0.53</td>
<td>1.42</td>
</tr>
<tr>
<td></td>
<td>0.49</td>
<td>1.81</td>
<td>0.53</td>
<td>0.53</td>
<td>1.34</td>
</tr>
<tr>
<td></td>
<td>0.40</td>
<td>1.81</td>
<td>0.58</td>
<td>0.58</td>
<td>1.30</td>
</tr>
<tr>
<td></td>
<td>0.38</td>
<td>2.03</td>
<td>0.58</td>
<td>0.58</td>
<td>1.45</td>
</tr>
<tr>
<td>Germany</td>
<td>0.26</td>
<td>0.84</td>
<td>1.71</td>
<td>0.49</td>
<td>1.49</td>
</tr>
<tr>
<td></td>
<td>0.23</td>
<td>0.91</td>
<td>1.76</td>
<td>0.52</td>
<td>1.64</td>
</tr>
<tr>
<td></td>
<td>0.27</td>
<td>0.89</td>
<td>1.80</td>
<td>0.52</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>0.24</td>
<td>0.88</td>
<td>1.90</td>
<td>0.57</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>0.24</td>
<td>0.90</td>
<td>2.01</td>
<td>0.61</td>
<td>1.70</td>
</tr>
<tr>
<td></td>
<td>0.24</td>
<td>0.87</td>
<td>2.02</td>
<td>0.60</td>
<td>1.73</td>
</tr>
<tr>
<td></td>
<td>0.25</td>
<td>0.85</td>
<td>2.05</td>
<td>0.64</td>
<td>1.73</td>
</tr>
<tr>
<td></td>
<td>0.28</td>
<td>0.80</td>
<td>1.97</td>
<td>0.64</td>
<td>1.60</td>
</tr>
<tr>
<td></td>
<td>0.32</td>
<td>0.73</td>
<td>2.03</td>
<td>0.62</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>0.32</td>
<td>0.73</td>
<td>1.95</td>
<td>0.60</td>
<td>1.46</td>
</tr>
<tr>
<td></td>
<td>0.26</td>
<td>0.85</td>
<td>1.93</td>
<td>0.61</td>
<td>1.60</td>
</tr>
<tr>
<td></td>
<td>0.26</td>
<td>1.93</td>
<td>0.93</td>
<td>0.35</td>
<td>0.28</td>
</tr>
<tr>
<td>Czechia</td>
<td>0.27</td>
<td>1.45</td>
<td>0.29</td>
<td>1.48</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>0.24</td>
<td>1.37</td>
<td>0.29</td>
<td>1.37</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>0.28</td>
<td>1.34</td>
<td>0.26</td>
<td>1.34</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>0.26</td>
<td>1.38</td>
<td>0.26</td>
<td>1.38</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>0.26</td>
<td>1.39</td>
<td>0.27</td>
<td>1.39</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>0.29</td>
<td>1.42</td>
<td>0.29</td>
<td>1.42</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>0.35</td>
<td>1.33</td>
<td>0.32</td>
<td>1.33</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>0.32</td>
<td>1.33</td>
<td>0.28</td>
<td>1.33</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>0.28</td>
<td>1.38</td>
<td>0.28</td>
<td>1.38</td>
<td>0.29</td>
</tr>
</tbody>
</table>

ECONOMIC ISSUES IN RETROSPECT AND PROSPECT II
Alexandra Górecka (PhD), Assoc Prof. Altuğ M. Köktaş, Agnieszka Parlińska (PhD)
THE SECTORS TURKEY HAS COMPARATIVE ADVANTAGES IN EXPORTS, POTENTIAL COMPETITORS IN THIS SECTORS AND COMPARATIVE ANALYSIS TO THEM

Kazim SARICOBAN, Elif KAYA

<table>
<thead>
<tr>
<th></th>
<th>CI</th>
<th>ETI</th>
<th>HTI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.78</td>
<td>1.05</td>
<td>1.15</td>
</tr>
<tr>
<td></td>
<td>1.79</td>
<td>1.15</td>
<td>1.18</td>
</tr>
<tr>
<td></td>
<td>2.21</td>
<td>1.04</td>
<td>1.06</td>
</tr>
<tr>
<td></td>
<td>2.03</td>
<td>1.16</td>
<td>1.07</td>
</tr>
<tr>
<td></td>
<td>2.08</td>
<td>1.30</td>
<td>1.17</td>
</tr>
<tr>
<td></td>
<td>2.16</td>
<td>1.20</td>
<td>1.17</td>
</tr>
<tr>
<td></td>
<td>2.23</td>
<td>1.11</td>
<td>1.21</td>
</tr>
<tr>
<td></td>
<td>2.13</td>
<td>1.09</td>
<td>1.12</td>
</tr>
<tr>
<td></td>
<td>2.19</td>
<td>1.03</td>
<td>1.05</td>
</tr>
<tr>
<td></td>
<td>2.22</td>
<td>0.96</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td>2.10</td>
<td>1.11</td>
<td>1.12</td>
</tr>
<tr>
<td>Advantage</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>RMI</th>
<th>LI</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.55</td>
<td>0.92</td>
<td>1.67</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>0.96</td>
<td>1.65</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>0.93</td>
<td>1.68</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>0.92</td>
<td>1.60</td>
</tr>
<tr>
<td></td>
<td>0.49</td>
<td>0.90</td>
<td>1.61</td>
</tr>
<tr>
<td></td>
<td>0.49</td>
<td>0.90</td>
<td>1.54</td>
</tr>
<tr>
<td></td>
<td>0.56</td>
<td>0.87</td>
<td>1.55</td>
</tr>
<tr>
<td></td>
<td>0.60</td>
<td>0.83</td>
<td>1.48</td>
</tr>
<tr>
<td></td>
<td>0.61</td>
<td>0.87</td>
<td>1.52</td>
</tr>
<tr>
<td></td>
<td>0.53</td>
<td>0.90</td>
<td>1.49</td>
</tr>
<tr>
<td>Disadvantage</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ETI</th>
<th>HTI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.86</td>
<td>1.31</td>
</tr>
<tr>
<td></td>
<td>0.94</td>
<td>1.42</td>
</tr>
<tr>
<td></td>
<td>0.96</td>
<td>1.40</td>
</tr>
<tr>
<td></td>
<td>0.93</td>
<td>1.51</td>
</tr>
<tr>
<td></td>
<td>0.92</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>0.94</td>
<td>1.60</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>1.62</td>
</tr>
<tr>
<td></td>
<td>0.87</td>
<td>1.59</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>1.45</td>
</tr>
<tr>
<td></td>
<td>0.91</td>
<td>1.59</td>
</tr>
<tr>
<td>Advantage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>RMI</th>
<th>LI</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.16</td>
<td>0.53</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>1.03</td>
<td>0.60</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>1.13</td>
<td>0.59</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>1.10</td>
<td>0.71</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>1.37</td>
<td>0.64</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>1.31</td>
<td>0.67</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>1.75</td>
<td>0.65</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>1.87</td>
<td>0.75</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>1.90</td>
<td>0.73</td>
<td>0.67</td>
</tr>
<tr>
<td>Advantage</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ETI</th>
<th>HTI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.75</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td>1.51</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>1.47</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>1.56</td>
<td>0.82</td>
</tr>
<tr>
<td></td>
<td>1.78</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>1.58</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>1.59</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>1.64</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>1.50</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>1.50</td>
<td>0.71</td>
</tr>
<tr>
<td>Advantage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>RMI</th>
<th>LI</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.06</td>
<td>0.27</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>0.06</td>
<td>0.32</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>0.07</td>
<td>0.21</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>0.06</td>
<td>0.22</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>0.05</td>
<td>0.18</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>0.05</td>
<td>0.15</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>0.06</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>0.07</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>0.08</td>
<td>0.18</td>
<td>0.18</td>
</tr>
<tr>
<td>Disadvantage</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ETI</th>
<th>HTI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.04</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>2.24</td>
<td>1.88</td>
</tr>
<tr>
<td></td>
<td>1.98</td>
<td>1.89</td>
</tr>
<tr>
<td></td>
<td>2.21</td>
<td>2.05</td>
</tr>
<tr>
<td></td>
<td>2.34</td>
<td>1.96</td>
</tr>
<tr>
<td></td>
<td>2.42</td>
<td>1.77</td>
</tr>
<tr>
<td></td>
<td>2.31</td>
<td>1.88</td>
</tr>
<tr>
<td></td>
<td>2.30</td>
<td>1.87</td>
</tr>
<tr>
<td></td>
<td>2.20</td>
<td>1.96</td>
</tr>
<tr>
<td></td>
<td>2.25</td>
<td>1.87</td>
</tr>
<tr>
<td>Advantage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>RMI</th>
<th>LI</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.67</td>
<td>0.94</td>
<td>1.16</td>
</tr>
<tr>
<td></td>
<td>0.65</td>
<td>0.96</td>
<td>1.19</td>
</tr>
<tr>
<td></td>
<td>0.67</td>
<td>0.84</td>
<td>1.17</td>
</tr>
<tr>
<td></td>
<td>0.69</td>
<td>0.92</td>
<td>1.21</td>
</tr>
<tr>
<td></td>
<td>0.62</td>
<td>0.84</td>
<td>1.23</td>
</tr>
<tr>
<td></td>
<td>0.66</td>
<td>0.91</td>
<td>1.31</td>
</tr>
<tr>
<td></td>
<td>0.54</td>
<td>0.75</td>
<td>1.24</td>
</tr>
<tr>
<td></td>
<td>0.65</td>
<td>0.79</td>
<td>1.35</td>
</tr>
<tr>
<td></td>
<td>0.55</td>
<td>0.80</td>
<td>1.32</td>
</tr>
<tr>
<td></td>
<td>0.59</td>
<td>0.83</td>
<td>1.43</td>
</tr>
<tr>
<td></td>
<td>0.63</td>
<td>0.86</td>
<td>1.43</td>
</tr>
<tr>
<td>Disadvantage</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ETI</th>
<th>HTI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.08</td>
<td>0.88</td>
</tr>
<tr>
<td></td>
<td>1.21</td>
<td>0.93</td>
</tr>
<tr>
<td></td>
<td>1.12</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>1.22</td>
<td>0.88</td>
</tr>
<tr>
<td></td>
<td>1.10</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>1.11</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>0.89</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td>0.95</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td>1.06</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td>1.08</td>
<td>0.81</td>
</tr>
<tr>
<td>Advantage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>RMI</th>
<th>LI</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.10</td>
<td>0.35</td>
<td>2.20</td>
</tr>
<tr>
<td></td>
<td>0.11</td>
<td>0.38</td>
<td>2.44</td>
</tr>
<tr>
<td></td>
<td>0.12</td>
<td>0.38</td>
<td>2.32</td>
</tr>
<tr>
<td></td>
<td>0.10</td>
<td>0.37</td>
<td>2.38</td>
</tr>
<tr>
<td></td>
<td>0.10</td>
<td>0.39</td>
<td>2.24</td>
</tr>
<tr>
<td></td>
<td>0.12</td>
<td>0.37</td>
<td>2.24</td>
</tr>
<tr>
<td></td>
<td>0.12</td>
<td>0.37</td>
<td>2.24</td>
</tr>
<tr>
<td></td>
<td>0.14</td>
<td>0.37</td>
<td>2.24</td>
</tr>
<tr>
<td></td>
<td>0.14</td>
<td>0.35</td>
<td>2.24</td>
</tr>
<tr>
<td></td>
<td>0.14</td>
<td>0.33</td>
<td>2.24</td>
</tr>
<tr>
<td>Disadvantage</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ETI</th>
<th>HTI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.93</td>
<td>2.09</td>
</tr>
<tr>
<td></td>
<td>0.93</td>
<td>2.19</td>
</tr>
<tr>
<td></td>
<td>0.89</td>
<td>2.26</td>
</tr>
<tr>
<td></td>
<td>0.81</td>
<td>2.44</td>
</tr>
<tr>
<td></td>
<td>0.83</td>
<td>2.67</td>
</tr>
<tr>
<td></td>
<td>0.79</td>
<td>2.52</td>
</tr>
<tr>
<td></td>
<td>0.81</td>
<td>2.31</td>
</tr>
<tr>
<td></td>
<td>0.73</td>
<td>2.25</td>
</tr>
<tr>
<td></td>
<td>0.69</td>
<td>2.10</td>
</tr>
<tr>
<td></td>
<td>0.65</td>
<td>2.11</td>
</tr>
<tr>
<td>Advantage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>RMI</th>
<th>LI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.05</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>2.29</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>2.28</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>2.24</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>2.24</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>2.20</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>2.30</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>2.78</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>2.46</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>2.37</td>
<td>0.55</td>
</tr>
<tr>
<td>Advantage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>LI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>0.55</td>
</tr>
<tr>
<td>Disadvantage</td>
<td></td>
</tr>
</tbody>
</table>
According to the table, countries have competitive advantages, in other words, they have competitiveness, in the following goods exports; USA in easy- and hard-to-imitate research-based goods, China in labour-intensive, easy- and hard-to-imitate research-based goods; Italy in labour-intensive, capital-intensive and hard-to-imitate research-based goods, the UK in a capital-intensive and easy-to-imitate research-based goods; Mexico in capital-intensive, easy- and hard-to-imitate research-based goods.

So far, firstly the countries having highest export similarity with Turkey is designated, and then those countries export advantages/disadvantages condition is analysed pursuant to the classification of those countries’ SITC technology for each group. Now, Turkey’s RCA values on
labour-intensive and capital-intensive sectors are compared with the RCA values of its potential competitors, as Turkey is competitive only in these two sectors.

The following two tables (Table 6 and 7) are divided into columns, which are labour intensive and capital intensive. Each column is divided into three sub-columns within itself and shown in two separate tables. In the first column, countries are shown; the second column illustrates export similarity to Turkey’s potential rivals in the sector concerned is given in per cent. In the third column, RCA values are provided. If the countries have a competitive advantage in labour intensive or capital intensive sectors (if RCA ≥ 1), the RCA value is written, if not (RCA <1), X is inserted instead.

**Table 6: A Comparison between Turkey and Its Potential Competitor in Labour Intensive Sectors**

<table>
<thead>
<tr>
<th>Labour Intensive</th>
<th>Countries</th>
<th>Turkey’s ESI (2016) (%)</th>
<th>Countries’ RCA Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>80</td>
<td>3,18</td>
<td></td>
</tr>
<tr>
<td>Vietnam</td>
<td>66</td>
<td>3,11</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>69</td>
<td>2,75</td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>-</td>
<td>2,67</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>73</td>
<td>2,03</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>61</td>
<td>1,72</td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>56</td>
<td>1,59</td>
<td></td>
</tr>
<tr>
<td>Czechia</td>
<td>-</td>
<td>1,38</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>77</td>
<td>1,11</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>62</td>
<td>1,07</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>55</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td>70</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>63</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>66</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Netherland</td>
<td>66</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>64</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>-</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>-</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>-</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

In the export of goods in labour-intensive sectors, the three countries having higher RCA values than Turkey are China, Vietnam, and India respectively. Of these countries, Turkey’s exports similarity is the highest with China by 80 per cent. It is followed by India (69%), and Vietnam (66%). These results demonstrate that Turkey's main rivals in the labour-intensive sectors are China, Vietnam, and India. Moreover, the countries with RCA values higher than 1 such as Italy, Poland, Hong Kong are also fierce competitors in the export of labour-intensive goods.
According to the table, although Turkey is similar to the United States by 55 per cent in the exports of labour-intensive goods, the US has no competitive advantage in the sectors on a global scale. Likewise, Turkey has similarity with South Korea by 70%, but it has no competitive advantage in the labour-intensive sectors on a global scale either. Besides, Germany, France, the Netherlands and the United Kingdom are alike with previous ones. It means that these countries are not in competition with Turkey in the export of labour-intensive goods on a global scale.

Recall that 14 countries are included in the export similarity at the beginning. Wherein +4 countries (the Czechia, Japan, Canada and Mexico), are the countries involved in the export of capital-intensive sectors in the sequence of similarity with Turkey. As a result of the analysis, it is found that the Czechia is also one of these countries has a competitive advantage in exports of labour-intensive sectors on the world scale.

Table 7: A Comparison between Turkey and Its Potential Competitors in Capital Intensive Sectors

<table>
<thead>
<tr>
<th>Capital Intensive Countries</th>
<th>Turkey’s ESI (2016) (%)</th>
<th>Countries’ RCA Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1   Japan</td>
<td>83</td>
<td>2,43</td>
</tr>
<tr>
<td>2   Spain</td>
<td>86</td>
<td>2,30</td>
</tr>
<tr>
<td>3   Czechia</td>
<td>80</td>
<td>2,10</td>
</tr>
<tr>
<td>4   Germany</td>
<td>83</td>
<td>1,93</td>
</tr>
<tr>
<td>5   Turkey</td>
<td>-</td>
<td>1,90</td>
</tr>
<tr>
<td>6   Mexico</td>
<td>73</td>
<td>1,82</td>
</tr>
<tr>
<td>7   Poland</td>
<td>-</td>
<td>1,78</td>
</tr>
<tr>
<td>8   France</td>
<td>73</td>
<td>1,58</td>
</tr>
<tr>
<td>9   South Korea</td>
<td>95</td>
<td>1,48</td>
</tr>
<tr>
<td>10  Canada</td>
<td>77</td>
<td>1,46</td>
</tr>
<tr>
<td>11  Belgium</td>
<td>92</td>
<td>1,38</td>
</tr>
<tr>
<td>12  United Kingdom</td>
<td>81</td>
<td>1,25</td>
</tr>
<tr>
<td>13  Italy</td>
<td>85</td>
<td>1,18</td>
</tr>
<tr>
<td>14  USA</td>
<td>85</td>
<td>X</td>
</tr>
<tr>
<td>15  China</td>
<td>78</td>
<td>X</td>
</tr>
<tr>
<td>16  India</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>17  Netherlands</td>
<td>78</td>
<td>X</td>
</tr>
<tr>
<td>18  Hong Kong</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>19  Vietnam</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

In the export of goods in capital-intensive sectors, there are four countries has higher RCA value than Turkey; namely, Japan, Spain, Czechia and Germany respectively. Among them, Spain (86 per cent) is the most similar country in terms of capital-intensive goods exports. Spain is followed by Japan and Germany with 83 per cent and Czechia with 80 per cent. These countries
are the major competitors of Turkey in the capital-intensive goods exports. Furthermore, Mexico, Poland, France have RCA value higher than 1, which means they are also strong competitors of Turkey in the exports of capital-intensive goods on a global scale. According to the table, the US shows 85 per cent similarity with Turkey in the exports of capital-intensive goods, but it has no competitiveness with a low RCA value (the US RCA <1). Likewise, Turkey is similar to China and the Netherlands (78%), both shows no competitiveness in the exports of goods in capital-intensive sectors on a global scale. This means that these countries, in the export of capital-intensive goods, are not the countries Turkey need to get in a competition. Again, 14 countries are included in the export similarity at the beginning, wherein +4 countries (Poland, India, Hong Kong and Vietnam) are located in the similarity ranking. As a result of the calculations, only Poland out of these four has a global competitive advantage in the export of goods in capital-intensive sectors.

**Conclusion**

In the paper, in order to determine the potential competitors of Turkey in the exports and their global export performance; firstly, Turkey’s competitiveness is identified by SITC technology classification. Secondly, the first fifteen countries in the world ranking quantitatively in the sectors that Turkey has a competitive advantage in 2014, 2015 and 2016 are located by using the data obtained from the Comtrade database. To see how corresponding with the biggest fifteen to Turkey with regard to exports of labour intensive and capital intensive goods, Export Similarity Index is calculated. In the next stage, competitive advantages/disadvantages of 15 countries in the ranking (considering both groups, 19 countries in total) are determined according to the SITC technology classification, the results converted to the tables, and finally, a comparison is made with Turkey.

In the analysis which is made by using the export data between 2007-2016 and Vollrath Relative Export Advantage Index, it is seen that, in the last decade’s average, Turkey has a competitive advantage on the export of goods in labour-intensive and capital-intensive sectors on a global scale. Afterwards, the top 15 countries with the highest share of world exports (including Turkey) of goods in the labour-intensive and capital-intensive sectors are identified, and the similarity rate by exports with Turkey are calculated. Accordingly, in 2016, among first 14 countries, the countries having the highest similarity rate to Turkey in the labour-intensive sectors can be listed as China (80%), Spain (77%), Italy (73%) and South Korea (70%). For the capital-intensive sectors, the similarity ranking for 2016 can be listed as South Korea (95%), Belgium (92%), Spain (86%) and Italy (85%).

Then, analyses are made according to the SITC technology classification for all 19 countries. According to the findings, it is deemed that countries have a competitive advantage in the export of the following goods; the US in easy- and hard-to-imitate research-based goods; China
in labour-intensive, easy-to-imitate and hard-to-imitate research-based goods; Italy in labour-intensive, capital-intensive and difficult-to-imitate research-based goods; the UK in capital intensive and easy-to-imitate research-based goods; and Mexico in capital-intensive, easy- and hard-to-imitate research-based goods. In other words, they have export competitiveness on these goods exports.

In the following section, Turkey’s potential competitors within them are selected, and Turkey is compared with those. The countries are chosen from the countries that have a competitive advantage in the exports of labour-intensive and capital-intensive goods.

Accordingly, Turkey’s most serious rival by RCA ranking in the export of goods in labour-intensive sectors are China, Vietnam and India, respectively; also, countries like Italy, Poland, Hong Kong, Czechia, Spain, and Belgium are strong rivals. However, the countries showing high similarity with Turkey in the exports, such as the US, South Korea, and Germany has no advantage in labour-intensive sectors on a global scale. So, it can be stated that these countries are not in competition with Turkey in the export of labour-intensive goods globally.

According to RCA values, the most serious competitors of Turkey in the exports in capital-intensive goods are Japan, Spain, Czechia and Germany; moreover, South Korea, Italy, Poland, Mexico, France, Canada, Belgium and the UK are strong competitors for Turkey in this sector. Nevertheless, even though the United States, China and the Netherlands demonstrate high similarity with Turkey in the exports, they do not have competitive advantages in capital-intensive goods’ exports on a global scale. So these countries cannot be counted as competitors for Turkey in the export of capital-intensive goods.

To sum up, Turkey has a competitive advantage in the labour-intensive and capital-intensive goods exports on a global scale. In the analysis made by the top 15 countries on the ranking of world exports in these sectors, the main competitors of Turkey in the exports of labour-intensive goods are China, Vietnam and India; while the major competitors in the exports of capital-intensive goods are Japan, Spain, Czechia, and Germany.

If Turkey is eager to increase its exports in these sectors, to specialize on it and take a bigger share of the world exports, it must be able to identify its competitors first; and then, must know how to move in the global environment in where competitiveness is so intense so that to give its trade a direction with the right export and trade policies accordingly. Here, however, it is necessary to emphasize a point. Labour-intensive goods consist of low-value-added product groups. This has an insufficient effect in increasing the total exports of the country. Instead, in the long-term, Turkey’s production factors should be shifted to high-value-added products based on a research. Thus, it increases both the total exports and its share of the world exports. That is going to pave a way for Turkey to be among the world’s biggest and the most influential economies.
THE SECTORS TURKEY HAS COMPARATIVE ADVANTAGES IN EXPORTS, 
POTENTIAL COMPETITORS IN THIS SECTORS AND COMPARATIVE ANALYSIS TO THEM

Kazim SARICOBAN, Elif KAYA

References


PART II.
PART II. CHAP 6.
UNEMPLOYMENT HYSTERESIS ANALYSIS
FOR MIDDLE-INCOME COUNTRIES

Ali Eren ALPER

Introduction

Unemployment is at the top of the list of topics that attract constant interest in economic theory. As a result, many models have been established in the economic literature. Voluntary unemployment was supported by the Classical economists as the predominant notion on the concept of unemployment until the Great Depression of 1929. According to this approach, labor supply and labor demand determined by real wages must always be in equilibrium. In addition, anyone who accepts the current wage level and wants to find a job can be employed. The Marxist approach was the first one that opposed this view of classical economics. According to the Marxist approach, unemployment is a systematic problem derived from the nature of capitalism, and the main problem occurs due to continuous pressure of the capitalist class put on its existing employees. Another trend that opposed the ideas of the Classical economics on unemployment was the Keynesian approach. Accordingly, uncontrolled market economies may have a long-term impact. However they cannot find solutions to short-term problems and, hence the involuntary unemployment problem occurs. Keynes attributed the 1929 crisis to a lack of aggregate demand and argued that Say’s Law did not work in the short-run. Therefore, the problem of unemployment can only be eliminated by the state intervention of the economy (Dogan and Erdogan, 2016).

The focal point of studies conducted on unemployment has been shifted to the dynamic characteristics of the problem. In this context, there are three theories in explaining the dynamic characteristics of unemployment rates (Ayala et.al., 2012);

- The natural rate of unemployment hypothesis; defines a unique long-term equilibrium for unemployment rates. However, short-term temporary deviations from the long-run equilibrium can occur. Therefore, this theory states that unemployment rates are static and temporary effects of the shocks.

- The persistence hypothesis; states that it would take a long time to reach a long-term equilibrium following a shock experienced in unemployment rates. Therefore, it has long-term memory characteristics.

* Niğde Ömer Halisdemir University, Faculty of Economics and Administrative Sciences, Department of Public Finance, 2/210, 51240-Niğde, Turkey. E-mail: alierenalper@gmail.com, Tel: +90-388-225-2331
• The hysteresis hypothesis; asserts that unemployment rates have non-stationary unit root features that cause them not to establish equilibrium following the shock (Blanchard and Summers, 1986). Thus, temporary shocks on unemployment rates indicate permanent impacts. Among the reasons for this characteristic of unemployment rates are the laws protecting workers, the decline in the value of human capital during the period of unemployment, high real wages and social disturbances resulting from long unemployment (Phelps, 1967; Blanchard and Summers 1986; Clark 2003).

According to Cobham and Williams (1998), the hysteresis effect can be formulated as follows:

\[ U_t^* = U_{t-1}^* + k(U_{t-1} - U_{t-1}^*) ; \quad k \geq 0 \]  

(1)

here, \( U_t^* \), \( U_{t-1}^* \), and \( U_{t-1} \) denote the non-accelerating inflation rate of unemployment (NAIRU); NAIRU at time \( t-1 \); and the actual rate of unemployment at time \( t-1 \), respectively. \( k \) is the adjustment coefficient which has to be equal to or greater than zero. Economic shocks have the potential to increase NAIRU by which the hysteresis effect that indicates persistence in unemployment is formed.

The high and fluctuating unemployment rates, which also appear in Figure 1 and 2, are the spreading problems in middle-income countries. The dynamic characteristics of unemployment rates need to be comprehended in order to determine the most appropriate policy for solving this widespread problem.

Figure 1: Upper-middle income countries unemployment rates (1991-2017)
If unemployment stems from a structural issue, sooner or later the policy suggestions must focus on changing the structure of the labor market. If the problem is circumstantial, demand management policies should be implemented for smoothing temporary deviations. Nonetheless, it is not possible to distinguish the origins of the problem of unemployment so clearly. Sometimes cyclical fluctuations can also cause permanent changes in the equilibrium level of unemployment rates.

The fear of cyclical fluctuations to become a structural problem is not a new phenomenon and is called a problem of unemployment hysteresis. In their seminal work, Blanchard and Summers...
(1986) examined the prolonged impacts of unemployment shocks in Europe during the post-1970 period. The authors claim that studies favoring NAIRU have failed to determine the exogenous impacts of long-term fluctuations in the natural rate of unemployment. The main argument is that a temporary shock may have long-lasting effects on unemployment rates due to labor market rigidities. This problem, referred to as the hysteresis effect, is crucial to be analyzed for middle-income countries due to a few reasons. If the hysteresis effect is detected first, the policies to increase the aggregate demand in the short-run would be partially supported. The most important factor for determining whether or not a shock is transient involves detecting the source of shock (demand or supply shock, etc.). In some sense, disturbances that would occur in labor markets due to an overall demand shock can be compensated by either monetary or fiscal policies. If unemployment shocks are temporary, demand management policies would be sufficient for the policymakers to establish long-term equilibrium in the labor market (Bean et. al, 1986). On the other hand, an increase in the unemployment rate may be a result of the total supply shock. Such divergence may require the short-term demand management policies to be extended to structural and supply-side reforms (Draghi, 2014).

Although there are many studies conducted on unemployment hysteresis using time-series and panel data methods, there is still some debate in the empirical literature. Structural breaks in the unemployment rate series due to reasons such as unionization, the existence of the unemployed in hopelessness, and the opportunity costs of unemployment are present at the core of these debates. Some studies (Papell et al., 2000; Summers, 2003) claimed that structural breaks might account for the hysteresis effect.

Several studies in the literature (Chang, 2011; Tiwari, 2014; Bahmani-Oskooee, 2018; Albulescu and Tiwari, 2018) examined the characteristics of the labor markets in high-income countries, especially the USA and Europe. It is more important to determine the impacts of temporal shocks in labor markets on the middle-income countries which have been struggling with more frequent crises.

The World Bank classified lower-middle income countries as having an income per capita between $996- $3,895 in 2017 and upper-middle income countries as having an income per capita between 3,896-$12,055. This study aims to investigate the hysteresis effect in totally 33 (12 lower-middle and 21 upper-middle income) countries using Augmented Dickey-Fuller test developed with fractional frequency Fourier function (FIFADF). The remaining parts of the study are comprised of a literature review, econometric methodology, data and empirical results, respectively. The study is finalized with results and policy recommendations.

**Literature Review**

Studies in the literature usually seek answers to four questions about the dynamics of unemployment. The primary studies take into consideration such supply-side determinants in the
economy as labor market institutions or participation in education. The secondary studies are based on the determination of changes in unemployment rates with the help of multi-equation models. The tertiary studies are based on examining the structural factors of the economy such as preferences, technology, institutions and commodity prices. The quaternary studies focus on non-linear structures of unemployment dynamics with the help of business cycle asymmetry (Akdoğan, 2017). Studies aiming to test the natural rate of unemployment and unemployment hysteresis are listed in Table 1.

**Table 1: Selected Literature Review**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Country</th>
<th>Data Period</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chang and Lee (2011)</td>
<td>G-7 Countries</td>
<td>1992-2008, monthly</td>
<td>Unemployment hysteresis is detected for France, Germany, and Italy.</td>
</tr>
</tbody>
</table>
Econometric Methodology

In empirical literature, the most used methods to test unemployment hysteresis are the unit root tests. According to the results of the unit root tests, if the unemployment rates have unit root \([I (1)]\), i.e., if they do not tend to return to the average following the shocks experienced in the economy, the existence of hysteresis effect is accepted. Nevertheless, if unemployment rates are determined as stationary \([I (0)]\) according to the unit root test result, the existence of the hysteresis effect is rejected, and the long-term unemployment rates would tend to return to the average. However, recent studies have focused on nonlinear characteristics of unemployment. Davis and Haltiwanger (1992) pointed out that the decline in unemployment rates during the periods of economic growth is slower than the rise in unemployment during the recession.

One of the main reasons for this asymmetric characteristic of unemployment rates stems from the adjustment costs of labor incurred by firms. The costs of hiring and layoffs can be very different due to search costs, overhead costs, and severance pay. If the cost of positive adjustments (hiring) exceeds the cost of negative adjustments (layoffs), the intensity of the fluctuation in unemployment rates would be higher (Hamermesh and Pfann, 1996).
One of the suggestions made for the reason of asymmetry in unemployment rates is the cleansing effect of recessions mentioned by Caballero and Hammour (1991). In their study, it is claimed that those inferior technologies are cleansed of the production processes at a time of recession with a Schumpeterian point of view. As a result, they claimed that there were much bigger job losses in small production plants operating with low productivity than of larger production plants.

A third explanation for asymmetry is the insider-outsider theory developed by Lindbeck and Snower (2001). The high bargaining power that employees of firms (insiders) have during the period of upward circumstantial fluctuations, and therefore high wage rates, hamper new employee recruitments (outsiders). On the other hand, during the periods of downward circumstantial fluctuations, there are relatively stable employee wages, along with high rates of layoffs.

Due to the existence of this asymmetric effect on unemployment rates, FIFADF root test is utilized to include asymmetric effects in the analysis. The basic idea behind the FIFADF test is the usage of trigonometric terms to spot different breaks and asymmetric relationships. This test is an alternative to Perron (1990), Zivot-Andrews (1992), and Bai-Perron (2003) tests due to the inclusion of asymmetric relationship to the analysis during adjustment process (Christopoulos and Leon-Ledesma, 2011).

Becker et al. (2006) developed the unit root test with Fourier function. The most important advantage of the FIFADF test is that there is no need to predetermine the number, location, and form of breaks in the series.

Equation 2 is estimated in Becker et al. (2006).

\[ y_t = \alpha_0 + \gamma_1 \sin \left( \frac{2\pi kt}{T} \right) + \gamma_2 \cos \left( \frac{2\pi kt}{T} \right) + \varepsilon_t \] (2)

In Equation 2, \( \pi \) is the number of pi; \( k \) is the frequency value; \( t \) is the trend value, and \( T \) is the number of observations. Christopoulos and Leon-Ledesma (2011) stated that the frequency value could be determined within the range of \( k = [0.1, 0.2, ..., 4.9, 5] \) using Bayesian information criterion (BIC).

The degree of integration of FIFADF unit root test results and its interpretation on the dynamic characteristics of unemployment rates are given in Table 2.

<table>
<thead>
<tr>
<th>Order of Integration</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>I(0;0.5)</td>
<td>NAIRU</td>
</tr>
<tr>
<td>I(0.5,1)</td>
<td>Persistence</td>
</tr>
<tr>
<td>I(\geq1)</td>
<td>Hysteresis</td>
</tr>
</tbody>
</table>

*Table 2: Order of Integration of Unemployment Rate and Hypothesis*
Accordingly, if the series is determined as stationary at the first differences for Equation 2, i.e., I(1), then a shock in unemployment rates would have permanent effects and equilibrium expresses the existence of the hysteresis effect so that the unemployment level would move to a new level. On the other hand, if the series is determined as stationary, i.e., I(0), it would be determined that the shocks are temporary so that the variables would return to their original levels in the future. Considering that FIFADF unit root test series can also be integrated at values between zero and one, rather than just I(0) or I(1) traditionally, researchers have gained a great deal of flexibility in determining the dynamic properties of the series (Gil-Alana, 2002).

If the degree of integration is $0 \leq I < 0.5$, the series is covariance stationary and shocks would disappear relatively quicker in the long-run. If the degree of integration is $0.5 \leq I < 1$, the series is not covariance stationary, but it tends to return to the average, and shocks would disappear slower than before. Consequently, if $I \geq 1$, the series is not covariance stationary and does not tend to return to the average. Therefore the shock effects are permanent.

**Data and Empirical Results**

The most important feature that distinguishes this study from the other studies listed in Table 1 involves that the analysis of middle-income countries as the sample group instead of developed ones. For this purpose, according to the World Bank’s classification as of 2017, totally 33 countries which comprised of 12 lower-middle income (Bangladesh, Egypt, Georgia, India, Indonesia, Kenya, Moldova, Nigeria, Pakistan, Philippines, Tunisia and Vietnam) and 21 upper-middle income countries (Albania, Azerbaijan, Belarus, Brazil, Bulgaria, China, Colombia, Costa Rica, Cuba, Ecuador, Fiji, Guatemala, Iran, Malaysia, Mexico, Paraguay, Romania, Russia, South Africa, Thailand and Turkey) are included in the analysis. The unemployment rate data for the countries included in the analysis are obtained from the World Bank database over the period 1991-2017 based on the annual International Labor Organization (ILO) estimates. Descriptive statistics related to the unemployment series are given in Table 3.

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean</th>
<th>Median</th>
<th>Max.</th>
<th>Min.</th>
<th>St. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>18.95</td>
<td>18.81</td>
<td>24.82</td>
<td>13.05</td>
<td>4.21</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>7.76</td>
<td>7.27</td>
<td>11.87</td>
<td>4.91</td>
<td>2.53</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>3.56</td>
<td>3.59</td>
<td>5</td>
<td>2.20</td>
<td>0.81</td>
</tr>
<tr>
<td>Belarus</td>
<td>0.76</td>
<td>0.87</td>
<td>1.15</td>
<td>0.48</td>
<td>0.18</td>
</tr>
<tr>
<td>Brazil</td>
<td>8.71</td>
<td>8.44</td>
<td>13.92</td>
<td>5.95</td>
<td>1.96</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>13.08</td>
<td>12.27</td>
<td>21.39</td>
<td>5.61</td>
<td>4.86</td>
</tr>
<tr>
<td>Country</td>
<td>Mean</td>
<td>Median</td>
<td>Max.</td>
<td>Min.</td>
<td>St. Dev.</td>
</tr>
<tr>
<td>------------</td>
<td>------</td>
<td>--------</td>
<td>------</td>
<td>------</td>
<td>----------</td>
</tr>
<tr>
<td>China</td>
<td>4.43</td>
<td>4.47</td>
<td>4.89</td>
<td>3.76</td>
<td>0.24</td>
</tr>
<tr>
<td>Colombia</td>
<td>11.69</td>
<td>11.20</td>
<td>20.52</td>
<td>7.80</td>
<td>3.36</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>6.62</td>
<td>6.16</td>
<td>10.18</td>
<td>3.93</td>
<td>1.93</td>
</tr>
<tr>
<td>Cuba</td>
<td>4.49</td>
<td>3.29</td>
<td>9.69</td>
<td>1.58</td>
<td>2.83</td>
</tr>
<tr>
<td>Ecuador</td>
<td>7.29</td>
<td>7.31</td>
<td>14.42</td>
<td>3.08</td>
<td>2.95</td>
</tr>
<tr>
<td>Egypt</td>
<td>10.47</td>
<td>10.49</td>
<td>13.15</td>
<td>7.95</td>
<td>1.65</td>
</tr>
<tr>
<td>Fiji</td>
<td>6.94</td>
<td>6.63</td>
<td>9.02</td>
<td>4.62</td>
<td>1.40</td>
</tr>
<tr>
<td>Georgia</td>
<td>12.92</td>
<td>12.62</td>
<td>16.84</td>
<td>9.02</td>
<td>2.17</td>
</tr>
<tr>
<td>Guatemala</td>
<td>2.70</td>
<td>2.80</td>
<td>4.13</td>
<td>1.30</td>
<td>0.65</td>
</tr>
<tr>
<td>India</td>
<td>3.89</td>
<td>3.81</td>
<td>4.43</td>
<td>3.41</td>
<td>0.33</td>
</tr>
<tr>
<td>Indonesia</td>
<td>5.20</td>
<td>5.15</td>
<td>8.06</td>
<td>2.59</td>
<td>1.53</td>
</tr>
<tr>
<td>Iran</td>
<td>11.48</td>
<td>11.25</td>
<td>14.63</td>
<td>9.04</td>
<td>1.53</td>
</tr>
<tr>
<td>Kenya</td>
<td>10.80</td>
<td>10.48</td>
<td>12.17</td>
<td>10</td>
<td>0.76</td>
</tr>
<tr>
<td>Malaysia</td>
<td>3.25</td>
<td>3.25</td>
<td>3.76</td>
<td>2.45</td>
<td>0.33</td>
</tr>
<tr>
<td>Mexico</td>
<td>3.97</td>
<td>3.66</td>
<td>6.89</td>
<td>2.49</td>
<td>1.07</td>
</tr>
<tr>
<td>Moldova</td>
<td>7.20</td>
<td>7.38</td>
<td>11.13</td>
<td>3.69</td>
<td>2.22</td>
</tr>
<tr>
<td>Nigeria</td>
<td>4.53</td>
<td>4.39</td>
<td>7.06</td>
<td>3.70</td>
<td>0.81</td>
</tr>
<tr>
<td>Pakistan</td>
<td>4.98</td>
<td>5.18</td>
<td>8.27</td>
<td>0.65</td>
<td>2.10</td>
</tr>
<tr>
<td>Paraguay</td>
<td>5.94</td>
<td>5.36</td>
<td>10.76</td>
<td>3.40</td>
<td>1.72</td>
</tr>
<tr>
<td>Philippines</td>
<td>3.61</td>
<td>3.72</td>
<td>4.05</td>
<td>2.71</td>
<td>0.31</td>
</tr>
<tr>
<td>Romania</td>
<td>6.94</td>
<td>6.95</td>
<td>8.30</td>
<td>5.21</td>
<td>0.87</td>
</tr>
<tr>
<td>Russia</td>
<td>7.71</td>
<td>7.17</td>
<td>13.53</td>
<td>5.16</td>
<td>2.43</td>
</tr>
<tr>
<td>South Africa</td>
<td>24.46</td>
<td>24.67</td>
<td>30.30</td>
<td>16.90</td>
<td>2.75</td>
</tr>
<tr>
<td>Thailand</td>
<td>1.41</td>
<td>1.22</td>
<td>3.40</td>
<td>0.49</td>
<td>0.77</td>
</tr>
<tr>
<td>Tunisia</td>
<td>15.24</td>
<td>15.51</td>
<td>18.33</td>
<td>12.36</td>
<td>1.62</td>
</tr>
<tr>
<td>Turkey</td>
<td>9.09</td>
<td>8.80</td>
<td>12.55</td>
<td>6.49</td>
<td>1.56</td>
</tr>
<tr>
<td>Vietnam</td>
<td>2.21</td>
<td>2.12</td>
<td>2.87</td>
<td>1.77</td>
<td>0.28</td>
</tr>
</tbody>
</table>

The results of FIFADF unit root for the unemployment rate series for totally 33 surveyed countries are shown in Table 4.
Table 4: FIFADF Unit Root Test Results

<table>
<thead>
<tr>
<th>Country Name</th>
<th>Degree of Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>0.90</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>1</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>0.30</td>
</tr>
<tr>
<td>Belarus</td>
<td>0.60</td>
</tr>
<tr>
<td>Brazil</td>
<td>1.60</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0.20</td>
</tr>
<tr>
<td>China</td>
<td>1.30</td>
</tr>
<tr>
<td>Colombia</td>
<td>1.10</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0.40</td>
</tr>
<tr>
<td>Cuba</td>
<td>0.50</td>
</tr>
<tr>
<td>Ecuador</td>
<td>1</td>
</tr>
<tr>
<td>Egypt</td>
<td>0.60</td>
</tr>
<tr>
<td>Fiji</td>
<td>1.50</td>
</tr>
<tr>
<td>Georgia</td>
<td>1.30</td>
</tr>
<tr>
<td>Guatemala</td>
<td>1.20</td>
</tr>
<tr>
<td>India</td>
<td>1.10</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.90</td>
</tr>
<tr>
<td>Iran</td>
<td>1.70</td>
</tr>
<tr>
<td>Kenya</td>
<td>0.80</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1.70</td>
</tr>
<tr>
<td>Mexico</td>
<td>1.70</td>
</tr>
<tr>
<td>Moldova</td>
<td>0.70</td>
</tr>
<tr>
<td>Nigeria</td>
<td>0.20</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1.10</td>
</tr>
<tr>
<td>Paraguay</td>
<td>1.30</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.20</td>
</tr>
<tr>
<td>Romania</td>
<td>1.80</td>
</tr>
<tr>
<td>Russia</td>
<td>1</td>
</tr>
<tr>
<td>South Africa</td>
<td>1.20</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.90</td>
</tr>
<tr>
<td>Tunisia</td>
<td>1.30</td>
</tr>
<tr>
<td>Turkey</td>
<td>0.80</td>
</tr>
<tr>
<td>Vietnam</td>
<td>1.60</td>
</tr>
</tbody>
</table>

Since unemployment series of Bangladesh, Bulgaria, Costa Rica, Nigeria and Philippines are within the range between $0 \leq I < 0.5$ according to the FIFADF unit root test results, the series
are covariance stationary, and the shocks would cease to exist relatively quicker in the long-run. Since the unemployment series of Albania, Belarus, Cuba, Egypt, Indonesia, Kenya, Moldova, Thailand, and Turkey are at the level of integration $0.5 \leq I < 1$, the series are not covariance stationary, but it tends to revert to average, and shocks would disappear within a longer period than the countries in the previous group. Since the series of Azerbaijan, Brazil, China, Colombia, Ecuador, Fiji, Georgia, Guatemala, India, Iran, Malaysia, Mexico, Pakistan, Paraguay, Romania, Russia, Tunisia, South Africa and Vietnam are not covariance stationary ($I \geq 1$), it does not tend to revert to the average, so that the existence of the hysteresis effect is proven, and a shock that can be experienced in unemployment rates can create long-lasting impacts.

**Conclusion**

Unemployment is one of the leading subjects of constant interest in economic theory. As a result, many models have been established in the economic literature. Until the Great Depression of 1929, classical economists’ views on unemployment had been acceptable. Those views are harshly opposed by J.M. Keynes who claimed that uncontrolled market economies having long-lasting effects cannot find any solution to short-run problems and that therefore an involuntary unemployment problem arises, and by Karl Marx who argued that unemployment is a systematic problem arising from the nature of capitalism.

The focal point of the studies conducted on unemployment following the petroleum shock of the 1970s has shifted to the dynamic characteristics of the problem. Accordingly, essentially three theories have been put forward that explains the dynamic nature of the unemployment phenomenon. These are the natural unemployment rate hypothesis, persistence hypothesis, and hysteresis hypothesis.

Natural unemployment rate hypothesis establishes that there is a unique long-run equilibrium for unemployment rates. However, it also implies that there may be temporary deviations from the long-run equilibrium in the short-run. The persistence hypothesis states that the long-term stabilization process would take a long time for establishing unemployment equilibrium following a shock experienced in unemployment rates. The hysteresis hypothesis asserts that unemployment rates exhibit non-stationary unit root features which cause them not to revert to equilibrium following a shock. Thus, it implies that temporary shocks may inflict permanent impacts on unemployment rates. The reasons for that characteristic of unemployment rates include the laws protecting workers, the decline in the value of human capital during the unemployment period, high real wages and social disturbances resulting from long-lasting unemployment.

Unit root tests are the most commonly used methods to test the dynamic characteristics of unemployment rates in the empirical literature. According to the results of the unit root test, the
hysteresis effect is assumed to exist if the unemployment rates have unit root [I(1)]. Nevertheless, the existence of the hysteresis effect would be rejected if unemployment rates are determined to be stationary [I(0)]. However, recent studies have concentrated on nonlinear characteristics of unemployment. Davis and Haltiwanger (1992) pointed out that the decline in unemployment rates during periods of economic growth is slower than the rise in unemployment in the recession.

Due to the presence of this asymmetric effect on unemployment rates, the FIFADF unit root test would be utilized to include asymmetric effects into the analysis. The basic idea behind the FIFADF test is the use of trigonometric terms to capture different breaks and asymmetric relationships.

Considering the fact that FIFADF unit root test series can also be integrated into values between zero and one, besides the traditional options of I (0) or I (1), researchers are blessed with a great deal of flexibility in detecting the dynamic properties of the series. If the degree of integration is $0 \leq I < 0.5$, series are covariance stationary and shocks would disappear relatively quicker in the long-run. If the degree of integration is $0.5 \leq I < 1$, the series are not covariance stationary, but it tends to revert to the average, and it would take relatively longer time for the shocks to disappear. Subsequently, if $I \geq 1$, series are not covariance stationary, and it does not tend to revert to the average, so the shock impacts become permanent.

The most prominent feature distinguishing this study from the other studies in the literature is that it analyzes the middle-income countries instead of the developed countries in sampling. For this purpose, according to the World Bank’s 2017 classification, 33 countries with subcategories including 12 lower-middle income and 21 upper-middle income are included in the analysis. The unemployment rate data for the countries included in the analysis are obtained from the World Bank database for the period 1991-2017 based on ILO estimates of annual frequency.

The results of FIFADF unit root test show that, the series are covariance stationary, and the shocks would disappear relatively quicker in the long-run since the degree of integration of unemployment series of Bangladesh, Bulgaria, Costa Rica, Nigeria, and the Philippines are within the range of $0 \leq I < 0.5$. Since the degree of integration of unemployment series of Albania, Belarus, Cuba, Egypt, Indonesia, Kenya, Moldova, Thailand, and Turkey are within the range of $0.5 \leq I < 1$, the series are not covariance stationary but it tends to revert to the average, and it would take a longer time for the shocks to disappear than the countries in the previous group. The existence of the hysteresis effect is proven since the series of Azerbaijan, Brazil, China, Colombia, Ecuador, Fiji, Georgia, Guatemala, India, Iran, Malaysia, Mexico, Pakistan, Paraguay, Romania, Russia, Tunisia, South Africa and Vietnam are not covariance stationary ($I \geq 1$) and it does not tend to revert to the average, so that a shock that can be experienced in unemployment rates can create long-lasting effects.
References


Introduction

R & D is an important tool for raising the quality of the product and lowering the cost. However, there is no definite yield on R & D expenditure. Hence, R & D expenditure should be encouraged by policies that governments can apply. These incentives will not only improve certain firms or sectors but also increase the competitiveness of the country by providing the overall development of the country. Thus, the dependency of countries on foreign investments will be lowered. While the vast majority of R & D expenditure in the majority of developed countries is made by the private sector, universities and the public still have utter massiveness in developing countries.

R & D expenditures are the primary resource of technological innovations, new production techniques and productivity. The increase in R & D expenditure in this framework contributes to foreign trade by increasing the manufacturing of goods to be produced by new technologies, which increases the economic growth together with the production process, and eventually the increase in production reduces unemployment.

In this study, the effects of R & D expenditure on foreign trade, growth and employment for 28 EU countries will be tested by panel data analysis. Within this context, theoretical information about the topic was given firstly and then, the literature survey of this topic was included in the search. Later, the extent of R & D expenditure in the EU countries was determined and tested for the panel data analysis in the period of 2000-2015 for 28 EU countries. Within this scope, panel unit root tests were performed to determine the stability of the variables firstly, and then the results of the PMG estimator were included with the framework of the constituted ARDL model.

* Assist. Prof. Bartın University, ahmetkamaci@hotmail.com
Conceptual Framework and Literature Search

While the Neoclassical Growth Models that emerged in 1950s with Solow considered that the technology is exogenous, the later theories of endogenous growth that developed in the 1980s regarded technology as an endogenous factor. In the theories of endogenous growth conducted by Romer and Lucas, the technology is approached as an endogenous variable. The theory of endogenous growth argues that economic forces which operate freely within a decentralized market structure have determined internally instead of the external technological change which is not under the control of the market mechanism like the neoclassical model about economic growth. According to Romer (1994:3) “This work distinguishes itself from neoclassical growth by emphasizing that economic growth is an endogenous outcome of an economic system, not the result of forces that impinge from outside.” The approach of the R & D models, which is the driving force of endogenous growth, was originally propounded by Romer, later developed by Lucas, Riviera - Batiz, Grossman - Helpman and Aghion - Howitt. R & D models are the patterns describe that the growth process of developed countries and treat technology as a separate production activity.

Vernon has included R & D spending to foreign trade theories, acknowledging that technology developers will emerge in countries with high R & D spending. New (alternative) foreign trade theories advocate the manufacturing of new products at a lower cost, with emphasis on product and process innovation (Yıldırım and Kesiköglu, 2012:166-167). Romer interprets technological development as the continuity of clear additions to existing firm and capital stock; Schumpeter noted that new innovations create new products and devastate old monopolies, throwing them out of the market and causing creative demolition (Yeldan, 2010:221). The most prominent feature of the model that Romer established is the accelerating effect of human capital stock on economic growth. This model explains why countries with low human capital levels cannot develop (Romer, 1990:99).

With Schumpeter’s renowned expression, the theory of growth without innovations (new technologies) resembles Hamlet, which have not a Danish prince (Gülmez and Yardımcıoğlu, 2012, 336). Therefore, endogenous growth models can better explain the relationship between R & D activities and economic growth.

In their work in 1991, Rivera-Batiz and Romer internalized information and technology and examined the relationship between endogenous growth theory and economic integration. In this pattern, it is emphasized that the economic integration between the two developed countries will continuously increase the growth rate of the world (Rivera-Batiz and Romer, 1990:1-30). As for the studies of Grossman and Helpman, international capital flows are in the R & D sector and constitute the driving force of growth (Grossman and Helpman, 1988:1). Foreign trade expansion provides the encouragement of local R & D activities. Thus, it paves the way to the formation of positive externalities (Grossman and Helpman, 2003:196). The externalities
that will emerge are increasing the growth and the specific country's prosperity. According to the models created by Aghion and Howitt, technology is seen to increase in the countries that are innovating, while those that do not innovate are below the technology limit (Aghion and Howitt, 1992:323-351). Based on the works of Rivera-Batiz and Romer, Grossman and Helpman and Aghion and Howitt, the economic growth will multiply as the resources allocated to R & D will increase.

\[ Y = K^{1-a} (AL_y)\alpha \]  
\[ \frac{A}{A} = \delta L_A \]

Equation (1) indicates the standard production function and Y is output, A is productivity or knowledge, K is capital output, L_y is labor output, and L_A demonstrate the new information which is sought. Equation (2) shows R & D equality in R & D-based growth models and this equality is the source of scale effects. This equation displays that the increase in total factor productivity will be proportional to the number of labor units divided into R & D (Jones, 1995:761-762).

There are many studies dealing with the effects of R & D expenditures on foreign trade, economic growth and employment. However, the studies that deal with these 3 effects at the same time are not much in the academic literature. Yet, there are studies that deal with R & D expenditures separately with these three variables. The results of these studies are given in Table 1.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Countries</th>
<th>Method</th>
<th>Variables</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goel and Ram (1994)</td>
<td>For 52 countries (18 developing, 34 least developed) (1960-1985)</td>
<td>Panel Data Analysis</td>
<td>R &amp; D Expenditures and Economic Growth</td>
<td>It has been found that R &amp; D expenditures only boosts economic growth in high-income countries, but there is no causal relationship between R &amp; D expenditures and economic growth.</td>
</tr>
<tr>
<td>Landesmann and Pfaffermayr (1997)</td>
<td>7 OECD countries (1967-1987)</td>
<td>Panel Data Analysis</td>
<td>R &amp; D Expenditures and Export</td>
<td>In the United States, Britain and Japan, R &amp; D expenditures affect exports positively; R &amp; D expenditures in Germany and France is negatively affecting exports.</td>
</tr>
<tr>
<td>Authors</td>
<td>Countries</td>
<td>Method</td>
<td>Variables</td>
<td>Results</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Chuang (2000)</td>
<td>Taiwan (1952-1995)</td>
<td>Cointegration and causality test</td>
<td>Human Capital and Export</td>
<td>A positive relationship has been found between human capital and exports.</td>
</tr>
<tr>
<td>Freire-Serén (2001)</td>
<td>21 OECD Countries (1965-1990)</td>
<td>Panel Data Analysis</td>
<td>Economic growth with R &amp; D Expenditures</td>
<td>An increase of 1% in R &amp; D expenditures has been found to increase real GDP by 0.08%.</td>
</tr>
<tr>
<td>Sylwester (2001)</td>
<td>20 OECD Countries, including G-7 Countries (1981-1996)</td>
<td>Panel Data Analysis</td>
<td>Economic growth with R &amp; D Expenditures</td>
<td>While R &amp; D expenditures in the G7 countries seems to increase economic growth, there is no correlation between R &amp; D spending and economic growth across the 20 OECD countries.</td>
</tr>
<tr>
<td>Piva and Vivarelli (2005)</td>
<td>575 Italian firms (1992-1997)</td>
<td>GMM method</td>
<td>Innovation investments and number of employees</td>
<td>A positive relationship was found between innovation and employment.</td>
</tr>
<tr>
<td>Damijan and Kostevc (2008)</td>
<td>Slovenia (1996-2002)</td>
<td>Regression analysis</td>
<td>The exports of firms and innovation expenditures</td>
<td>A positive relationship has been found between export and innovation.</td>
</tr>
<tr>
<td>Aw et all. (2009)</td>
<td>Taiwan (2000-2004)</td>
<td>Time series analysis</td>
<td>R &amp; D Investments in electronic industry and exports</td>
<td>A positive relationship has been found between AR-GE and exports.</td>
</tr>
<tr>
<td>Sadraoui and Zina (2009)</td>
<td>23 countries (1992-2004)</td>
<td>GMM method</td>
<td>R &amp; D Expenditures and economic growth</td>
<td>In all countries, a positive relationship has been found between R &amp; D expenditures and economic growth.</td>
</tr>
<tr>
<td>Samimi and Alerasoul (2009)</td>
<td>30 developing countries (2000-2006)</td>
<td>Panel regression analysis</td>
<td>Economic growth with R &amp; D Expenditures</td>
<td>There was no significant relationship between the two variables.</td>
</tr>
</tbody>
</table>
The result of 18 different studies is given in table 1. In 8 of these studies, R & D expenditures and economic growth relation are discussed. While in the majority of the studies, there was a positive relationship between R & D and economic growth; in the works of Samimi and Alerasoul (2009), however, no causal relationship was found between the two variables. As for the studies of Goel and Ram (1994) and Sylwester (2001), a positive relationship was found in the high-income countries, whereas a causal relationship was not found in the low-income countries. R & D expenditures and foreign trade relations are examined in 7 of the studies. In the majority of these studies, exports were taken as foreign trade variable and a positive relationship was found between two variables. Yet, in Wakelin’s (1998) study, a negative relation between R & D expenditures and exports was found. In their studies, Landesmann and Pfaffermayr (1997) emphasize that R & D expenditures for different country groups are increasing and decreasing for some countries in exports. Finally, three of the literature surveys are about employment with R & D expenditures. From these studies, Piva and Vivarelli (2005) found a positive relationship between innovations and employment, but no relationship was found in other studies.

Progress of R & D Expenditures in EU Countries

The share allocated to R & D expenditures brings new technologies together. Thus, both the volume of foreign trade of the countries and production increases. As a result, unemployment will be reduced and economic growth about to realized. However, based on the year 2015, R
& D expenditures in all 28 EU countries are calculated as 298.8 billion Euros. In spite of this data, in the USA alone, R & D spending amounted to 344 billion Euros in the same year.

The value of R & D expenditure and its share in GDP in 28 EU countries and in some other countries demonstrated in table 2.

Table 2: R & D Expenditures in 28 EU Countries

<table>
<thead>
<tr>
<th></th>
<th>Share of R &amp; D Expenditures in GDP (%)</th>
<th>R &amp; D Expenditures (Billion Euro)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-EU</td>
<td>1,74</td>
<td>2,03</td>
</tr>
<tr>
<td>Austria</td>
<td>2,38</td>
<td>3,07</td>
</tr>
<tr>
<td>Belgium</td>
<td>1,78</td>
<td>2,45</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0,45</td>
<td>0,96</td>
</tr>
<tr>
<td>Crotia</td>
<td>0,86</td>
<td>0,85</td>
</tr>
<tr>
<td>Cyprus</td>
<td>0,37</td>
<td>0,46</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1,17</td>
<td>1,95</td>
</tr>
<tr>
<td>Denmark</td>
<td>2,39</td>
<td>3,03</td>
</tr>
<tr>
<td>Estonia</td>
<td>0,92</td>
<td>1,50</td>
</tr>
<tr>
<td>Finland</td>
<td>3,33</td>
<td>2,90</td>
</tr>
<tr>
<td>Greece</td>
<td>0,58</td>
<td>0,96</td>
</tr>
<tr>
<td>Hungary</td>
<td>0,92</td>
<td>1,38</td>
</tr>
<tr>
<td>Ireland</td>
<td>1,19</td>
<td>1,51</td>
</tr>
<tr>
<td>Italy</td>
<td>1,05</td>
<td>1,33</td>
</tr>
<tr>
<td>Latvia</td>
<td>0,53</td>
<td>0,63</td>
</tr>
<tr>
<td>Lithuanian</td>
<td>0,75</td>
<td>1,04</td>
</tr>
<tr>
<td>Luxemburg</td>
<td>1,59</td>
<td>1,31</td>
</tr>
<tr>
<td>Malta</td>
<td>0,53</td>
<td>0,77</td>
</tr>
<tr>
<td>Netherland</td>
<td>1,79</td>
<td>2,01</td>
</tr>
<tr>
<td>Poland</td>
<td>0,56</td>
<td>1,00</td>
</tr>
<tr>
<td>Portugal</td>
<td>0,76</td>
<td>1,28</td>
</tr>
<tr>
<td>Romania</td>
<td>0,41</td>
<td>0,49</td>
</tr>
<tr>
<td>Slovakia</td>
<td>0,49</td>
<td>1,18</td>
</tr>
<tr>
<td>Slovenia</td>
<td>1,41</td>
<td>2,21</td>
</tr>
<tr>
<td>Spain</td>
<td>1,10</td>
<td>1,22</td>
</tr>
<tr>
<td>Sweden</td>
<td>3,39</td>
<td>3,26</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1,57</td>
<td>1,70</td>
</tr>
<tr>
<td>China</td>
<td>1,32</td>
<td>2,05</td>
</tr>
<tr>
<td>Japan</td>
<td>3,31</td>
<td>3,59</td>
</tr>
<tr>
<td>South Korea</td>
<td>2,63</td>
<td>4,29</td>
</tr>
<tr>
<td>United States</td>
<td>2,51</td>
<td>2,73</td>
</tr>
</tbody>
</table>

Source:http://ec.europa.eu/eurostat
The countries that allocate the most resources to R & D expenditures according to Table 2 are the USA, China, Japan, Germany and France respectively. Among 28 EU countries, Germany is the one which allocates the most resources to R & D with 28.8 billion euros. When we look at the value of R & D expenditures in GDP, by the year 2015, South Korea (4.29%) and Japan (3.59) are in the first 2 rankings. In the EU countries, Sweden is in the first ranking with 3.26% in this context.

Batelle has made the following evaluations in his work "Global R-D Funding Forecast" in 2013 about R &D expenditures: The US, China, Japan and European countries have a share of 78% in total with R & D expenditures of $ 1.6 trillion in 2014. In the Western countries, R & D expenditures are on a wide range of areas such as robots, high-performance computers, social media, software, cost-effective energy sources and nanotechnology (Altıntaş ve Mercan, 2015:350). The alignment of the most important technologies of the future for 2021 are information technologies, software, artificial intelligence, robotic technologies, sustainability and medical diagnostics (R&D Magazine, 2018:35).

Empirical Approach and Data

Research Method

Panel data has two dimensions; cross section and time (N units and T time series). The use of two dimensions together is more advantageous in that it allows solving more complicated structures than analysis using only time dimension or only unit dimension (Hsiao, 2003: 7). We can simply show the panel data herein bellow:

\[ Y_{it} = \alpha + \beta_{1it} X_{1it} + \ldots + \beta_{kit} X_{kit} + \epsilon_{it} \quad (i=1,2,\ldots,N) \quad (t=1,2,\ldots,T) \]  

(3)

In this equation, \( i \) is the cross section of the lower index, and \( t \) is the time. In this equilibrium, the individual effect is the one that cannot be observed by independent equations, but does not change with time but covers the features which is specific to the sequences, and the different characteristics of the units included in the error term (Baltagi, 2001:11).

Within this framework, the effects of R & D expenditures on foreign trade, growth and employment will be examined. Four different models will be estimated in this study.

\[ EXGDP_{it} = \alpha + \beta_{1it} REDE_{it} + \epsilon_{it} \quad (i=1,2,\ldots,N) \quad (t=1,2,\ldots,T) \]  

(4)

\[ IMGDP_{it} = \alpha + \beta_{1it} REDE_{it} + \epsilon_{it} \quad (i=1,2,\ldots,N) \quad (t=1,2,\ldots,T) \]  

(5)

\[ GROW_{it} = \alpha + \beta_{1it} REDE_{it} + \epsilon_{it} \quad (i=1,2,\ldots,N) \quad (t=1,2,\ldots,T) \]  

(6)

\[ UNEM_{it} = \alpha + \beta_{1it} REDE_{it} + \epsilon_{it} \quad (i=1,2,\ldots,N) \quad (t=1,2,\ldots,T) \]  

(7)
Panel unit root tests are used to test for the presence of a common unit root for the undertaking panel. The rejection of the null hypothesis that there is a common unit root indicates that the members of the panel are close to each other in terms of the variable (Halaç and Kuştepe, 2008:7). The use of panel data unit root tests has been developed to increase the power of unit root tests based on a single time series (Maddala and Wu, 1999:631). In this study, unit root tests of Levin, Lin & Chu (LLC), Im, Pesaran & Shin (IPS), Fisher ADF and Fisher PP panel were used.

In this study, a panel autoregressive distributed delay (ARDL) model developed by Pesaran et al. is estimated, since all of the variables are not stable at the same time. The panel ARDL method allows testing whether there is a cointegration relationship between the series without the condition that they are integrated at the same time (Pesaran et al., 1999:623). In this context, the panel developed 2 estimators for the ARDL model as Average Group Estimator (MG) and Pooled Average Group Estimator (PMG). The PMG estimator adduces the constraint that long-run parameters are the same for countries in the panel, but allows short term coefficients to vary among the units.

Since the PMG estimator is a more effective estimator than MG (Baltagi, 2008: 72), the PMG estimator was used in this study.

Data

Data from 28 EU countries comprise the period of 2000-2015. All data used in the study were obtained from the World Bank database "databank.worldbank.org". The R & D data shows the percentage of R & D expenditures to GDP and is shown as "REDE" in the analysis. The export data shows the percentage of exports to GDP and "EXGDP" and import data shows the percentage of imports to GDP and is shown as "IMGDP". The economic growth rate is given as percentage and is shown as "GROW". Finally, unemployment rate is used for employment data and is shown as "UNEM" in the analysis.

Empirical Results

Analysis Results

In the study, four different models will be estimated. For this reason, panel unit root test was performed in series to determine the stability of the series. Table 3 gives the Panel Unit Root Test results.
Table 3: Panel Unit Root Test Results

<table>
<thead>
<tr>
<th>Değişken</th>
<th>LLC</th>
<th>IPS</th>
<th>Fisher ADF</th>
<th>Fisher PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>REDE</td>
<td>1.02858</td>
<td>4.25856</td>
<td>25.0211</td>
<td>25.4454</td>
</tr>
<tr>
<td>EXGDP</td>
<td>-0.12825</td>
<td>2.81142</td>
<td>22.5730</td>
<td>19.7937</td>
</tr>
<tr>
<td>IMGDP</td>
<td>-2.50079*</td>
<td>-0.26903</td>
<td>53.2097</td>
<td>48.4288</td>
</tr>
<tr>
<td>GROW</td>
<td>-7.32157*</td>
<td>-4.96957*</td>
<td>117.169*</td>
<td>164.547*</td>
</tr>
<tr>
<td>UNEM</td>
<td>-5.40353*</td>
<td>-2.92204*</td>
<td>87.8996*</td>
<td>42.5404</td>
</tr>
<tr>
<td>∆REDE</td>
<td>-2.21076**</td>
<td>-4.50756*</td>
<td>111.103*</td>
<td>269.928*</td>
</tr>
<tr>
<td>∆EXGDP</td>
<td>-7.53889*</td>
<td>-5.62313*</td>
<td>126.419*</td>
<td>224.226*</td>
</tr>
<tr>
<td>∆IMGDP</td>
<td>-10.1758*</td>
<td>-7.21889*</td>
<td>152.787*</td>
<td>299.678*</td>
</tr>
</tbody>
</table>

Note: *, ** indicates that the null hypothesis is rejected at levels 1% and 5%, respectively. ∆ indicates the first difference.

According to the panel root test results, economic growth and unemployment rate stable at the level of the variable. R & D expenditures, export and import variables embody unit root problem. Therefore, by taking the first difference of these variables, the series are made stationary.

The ARDL model was established because the variables studied are stable at different levels. In this frame, a PMG estimator was used, which is organized by Pesaran et al. Table 4 gives PMG estimator results.

Table 4: The Results of PMG Estimator

<table>
<thead>
<tr>
<th>Long Term Coefficients</th>
<th>Coefficient</th>
<th>Probably</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMGDP</td>
<td>0.010670</td>
<td>0.0008</td>
</tr>
<tr>
<td>EXGDP</td>
<td>-0.001010</td>
<td>0.6959</td>
</tr>
<tr>
<td>GROW</td>
<td>-0.004080</td>
<td>0.1164</td>
</tr>
<tr>
<td>UNEM</td>
<td>0.014930</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Error Correction Coefficient

Φ  
-0.255767  0.0001

Short Term Coefficients

| D(IMGDP) | -0.003910 | 0.4969 |
| D(EXGDP) | 0.004503 | 0.4797 |
| D(GROW)  | -0.008034 | 0.0056 |
| D(UNEM)  | -0.000284 | 0.9707 |
| C        | 0.185783 | 0.0026 |
According to Table 4, the fact that the error correction parameter is negative and significant indicates that there is a long-run relationship between explanatory variables and R & D expenditures. The error correction parameter also indicates that all series will not be stable at the same time, so that even if they deviate from balance, they will rebalance. According to these results, while there is no short-run relationship between imports and R & D expenditures, 1 unit increase in imports in the long run increases R & D expenditures by 0.01 units. Between economic growth and R & D expenditures, there is a short-lived relationship; no long-term relationship was detected. Among unemployment and R & D expenditures, there is no short-term relationship; there is a causality in the long run. Lastly, in export and R & D expenditures, a meaningful relationship cannot be determined in both short and long term.

Conclusion

The forerunner of the Neoclassical Growth model, Solow, has lost the validity of his convergence hypothesis. In this framework, the poor countries have not approached the rich countries, but the income difference between them has been multiplied even more. The main reason for this is R & D and technology. R & D, which can be identified as new product, new production technique and new knowledge, is an important notion for human capital. R & D is the primary resource of technological novelties and fruitfulness. R & D reduces production costs by increases product’s quality at the same time. In the rapidly globalized world, the fundamental stipulation which enable both companies and countries to compete against their competitors is the development of new technologies. Like Schumpeter’s well-known phrase, “carrying out innovations is the only function which is fundamental in history” History is a constant development process. The competitiveness of companies or countries will raise when they succeed in innovation. Thus, the production of goods will heighten and the volume of foreign trade of the countries will increase. Enhanced production will play a key role in reducing unemployment and ensuring economic growth.

Since R & D spending does not have a definite return, firms in developing countries do not engage in innovation activities. This leads to Posner’s technological gap theory. Countries that reserve more resources to R & D expenditures, have developed new technologies and new production techniques. Therefore, by encouraging R & D expenditures, the states ensure the development of both the private sectors and the country. This will lead to the development of countries by reducing foreign dependency.

In this study, the effects of R & D expenditure on foreign trade, growth and employment for 28 EU countries were tested by panel data analysis. Data belongs to the period of 2000-2015 for 28 EU countries were tested by panel data analysis. In this framework, panel unit root tests were first applied to determine the stability of the variables, and then the results of the PMG estimator were included within the framework of the constituted ARDL model.
According to the panel root test results, economic growth and unemployment rate are found stable. R & D expenditures, export and import variables contain unit root problem. Therefore, by taking the first difference of these variables, the series are made stationary. The ARDL model was established because the variables studied are stable at different levels. In this frame, a PMG estimator is used which is organized by Pesaran et al. According to the PMG estimator results, the negative and significant error correction parameter indicates a long-run relationship between explanatory variables and R & D expenditures. The error correction parameter also indicates that all series will not be stable at the same time, so that even if they deviate from balance, they will rebalance. According to these results, there is no short-term relationship between imports and R & D expenditures; In the long run, 1 unit increase in imports increases R & D spending by 0.01 units. Between economic growth and R & D expenditures, there is a short-lived relationship; no long-term relationship was detected. Among unemployment and R & D expenditures, there is no short-term relationship but there is a causality in the long run. Lastly, in export and R & D expenditures, a significant relationship cannot be determined in short and long term.
THE IMPACTS OF THE EXPENDITURES OF RESEARCH-DEVELOPMENT UPON FOREIGN TRADE,
GROWTH AND EMPLOYMENT: A PANEL DATA ANALYSIS FOR 28 EU COUNTRIES

Ahmet KAMACI

References


THE IMPACTS OF THE EXPENDITURES OF RESEARCH-DEVELOPMENT UPON FOREIGN TRADE, GROWTH AND EMPLOYMENT: A PANEL DATA ANALYSIS FOR 28 EU COUNTRIES

Ahmet KAMACI


PART II.

CHAP 8.

USAGE OF THE STATISTICAL APPROACHES IN ECONOMETRICS

Zeynep ÖZTÜRK

Introduction

A statistical study is the body of statistics unit description (mass, sample, variable, etc.), collection (evaluation, sampling, survey etc.) of data (medicine, economics, environment, population, education data etc.), and representation of these via different methods such as tables, curves or graphics. The variables are attempted to be applied in a model or a statistical distribution (Bernoulli, normal, exponential etc.) with the collected data. The existence of the relationship (functional, stochastic etc.) among data is researched.

In econometrics, only economic data and economic relations are studied with experimental methods by using math, statistics and computer science.

In generally, the classical and the Bayesian approaches are the two approaches in statistics. Most of the studies in econometric literature are towards the interpretation of estimators, which are only obtained from the likelihood approach, which is the part of the classical approach. The Bayesian approach for creation and evaluation of econometric models has been increasing during the recent years and it may find solutions for more analytic and complicated problems. The Bayesian approach helps to bring the likelihood approach (data) together with the existing information (informative prior) and the acquired statistical solution might be more useful from time to time. In other words, all the classical approaches towards assumptions, estimations, tests, model selections, controls and other problems may also be applied via the Bayesian approach as well and better results may be obtained than they are in the classical approach.

Econometrics study the relation between one or more than one dependent variable and one or more than one independent variable. A dependent variable or variables might be quantitative or qualitative. For example, the relation between the following variables could be modeled; quantity of a product, income and product prices; capital investment and expected income; cash flow and borrowing costs. The Bayesian econometrics is based on some simple rules of probability. This is one of the primary advantages of the Bayesian approach. The parameter estimation of

* Artvin Coruh University Hopa Faculty of Economics and Administrative Sciences, Department of Business Administration, Artvin, TURKEY, zozturk@artvin.edu.tr, +90(554) 871 52 86
a model, comparing different models or acquiring the forecast of a model, shortly, everything that an econometrician desires to do, include the same probability rules (Koop, 2003).

Administrators in the business world have to take risks and make decisions, which depend on numeric data, in ambiguity and under pressure. They should find a solution that minimizes the risk of the company. Proper data collection, analyzing and resulting might create new opportunities. Econometrics is a tool that supports decision makers’ information and experiences.

Buyers and sellers have reasonable doubts on the quality of their products and services and they demand to know whether their products are better than the current ones put on market by the rival companies. At this point, econometrics is used to determine whether the product/service expectations are well estimates for the mean value and if the quality against expectations, deviation from the mean value is a good estimate, so, the mean and the standard deviation of several rival companies are compared. Statistics and more specific econometric methods are applied during the decision-making progress by using different data such as sales revenues of a company, latest trends of the stock market and economy, unemployment, inflation and production etc.

The Bayesian econometrics is used for inference, estimation and decision analyses in economics, especially for macroeconomics, finance and marketing fields. For example:

- International companies which sell their own products abroad may find out the risk of the exchange rate that they are exposed when they return their own sales revenues.
- A new pricing method may be implemented by taking advantage of the previous pricing values.
- An auditor may use random sampling techniques to audit customer receivable accounts.
- A factory manager may use statistical quality control techniques to test or analyze the minimum production quality.
- A financial analyst may use regression and correlation to understand the relation of a financial rate with the other variables of the business world.
- A market researcher may use an important test to accept or reject a hypothesis about a buyer group which is the target for the sales of a product.
- A sales manager may use statistical techniques to estimate sales of the following year.

The Bayesian approach is a mathematical method revealed in the essay written by a British philosopher and mathematician, Thomas Bayes (1702-1761). The essay was found by his friend Richard Price two years after his death and published in Royal Society Journal with the title of “An Essay toward Solving a Problem in the Doctrine of Chances”. Probably, Thomas Bayes did not predict that this easy theory would be a statistical inference method. However, this theorem has affected many statisticians and mathematicians in the last 30 years and the Bayesian statistics is accepted as the basic statistical inference method. In recent years, technical
application of the Bayesian analysis has rapidly developed by the use of computers and it created new application fields.

In general, the application and the development of the Bayesian inference and decision techniques have increased for business, statistics, econometrics and the other disciplines since 1950s and 1960s. Friedman and Savage (1948, 1952) and Klein (1953, 1971) developed a theoretical Bayesian statistical approach that combines economic benefit theory with statistical theory and they used a much different test than the statistical estimation of sampling theory. Leamer (1978) also mentioned the Bayesian model in averaging and applied it to economic problems. Hong (1989) also used time series to estimate annual growth rate of real GDP and used the Bayesian approach to analyze third-order autoregressive leading indicator models. Diebold and Lamb (1997) found out that the use of the Bayesian minimum expected loss (MELO) estimators leads major decreases in relatively estimated mean square errors (MSE). Similarly, Park (1982), Tsurumi (1990), Gao and Lahiri (1999) and Zellner (1997, 276-287, 1998) discovered that the Bayesian MELO estimators are better than the estimators found with the classical approach (likelihood, two-stage least squares, ordinary least squares etc.). Zellner (1999), approached to the Bayesian and non-Bayesian practical scientific inference and decision models by using examples from economics, econometrics and business applications.

There are several studies for random two and multivariate models such as logit, probit etc., The Monte Carlo numerical integration, the Markov Chain, Monte Carlo (MCMC) techniques and these are applied to marketing, education, and business market etc. data. For example; Albert and Chib (1993), Berry et al. (1996), Gelman et al. (1995), Geweke (1989), McCulloch and Rossi (1990, 1994), Pole, West and Harrison (1994), Tobias (1999) and Zellner and Rossi (1984). Geweke (1989), Chib and Greenberg (1996), Gelman et al. (1995). At the same time, Fernandez et al. (2001) (growth regression), Garratt et al. (2003) and Jacobson and Karlsson (2004) used the Bayesian model averaging for macroeconomic estimations.

The Bayesian approach takes parameter uncertainty into consideration as it might be very important for many applications. It helps to obtain all the estimator distributions other than the point estimation based on the parameter distribution mode as in the classical approach. An important advantage of this feature is; it makes analyze of the different parts of estimator distribution easier. It provides an advantage for the analysis of different risks in finance and macroeconomics. Basturk, Cakmakli, Ceyhan and Van Dijk (2013) gave an example of the evaluation of the probability for USA. Güriş and Sağıldı (2011) aimed to compare the Bayesian approached volatility models by taking market development levels into consideration.
Comparison of the Classical Approach and the Bayesian Approach

In the Bayesian approach, parameters showing the mass attribute are defined as random variables whereas parameters are defined as constant and indeterminate values in the classical approach. Only the information obtained from the data (probability function) is used for interpretations in the classical approach. However, the Bayesian approach uses the posterior distribution obtained from the combination of preliminary information and the information gathered from the data. An economist takes the economic results of a decision into consideration to make a decision. In the Bayesian approach, random sampling information is considered together with the positive and negative situations of the decision. In the classical approach, the inference is made according to the information derived from the sample only. In the Bayesian approach, including the expert opinion into the inference gives better results. The Bayesian approach may be used for the decision-making process to increase product quality of a production company with the use of previous experiences.

Probability shows the frequency of different results which would be experienced by the result of a random experiment, in other words, it means study of the uncertainty. In the classical approach, samples are taken from the mass and sample statistics are calculated, also the probability distribution is formed by the statistics of random samples is defined as sampling distribution. Probability definition is not used for parameter values. In the Bayesian approach, although the real value of parameters are unknown, they are assumed as random variables and probabilities may be calculated for parameters, observations and sample statistics. Probability rules are directly applied to make deduction about parameters. Parameter probability definitions are interpreted as degree of belief and these definitions are subjective. In the classical approach, the methods are applied to all available random samples and new methods are developed according the performance of the results. In the Bayesian approach, only the Bayesian Theory is used. The Bayesian theory is based on probability concept.

Preliminary information is never used for the classical approach and it is defined as objective. In general, there is preliminary information in scientific studies and ignoring this preliminary information might cause loss of data and money. There is at least one subjective idea about the data before observation. These are prior probabilities and it is important to define them correctly. If these are defined incorrectly, incorrect results might be obtained.

There are some advantages and disadvantages for Bayesian and the classical approaches. The advantages of the Bayesian approach are below:

- Under the theoretical roof, it provides a basic and natural way for the combination of data with the prior information. All inferences are under the Bayesian theory.
- It uses the probability principle. If the proportional likelihood function for parameter is created for two different sampling design, than all the inferences for the parameter become
similar for these two sampling design. Compliance with the likelihood principle is not required for the classical inferences.

• It may be interpreted as “The probability of the parameter is 95% whereas the degree of belief interval is 95%”.
• It sets suitability of loss data models and hierarchical models to a wide interval. Almost all calculations are made for the parametric models by MCMC numeric calculation method.

The disadvantages of Bayesian analysis:

• It does not give information about the prior selection.
• The obtained posterior distributions are are highly affected by the priories.
• Calculation costs are high especially for the models with high number of parameters. Additionally, simulations return different results if similar random sample is not used.

The Classical approach

In the classical inference is combined the observed data and informations about the parameters (mean, variance, etc…) using the sampling distribution. The sampling distribution is determined by the density function $p(x; \theta)$.

Introduction to the Bayesian Approach

In the Bayesian inference is combined the observed data and the informations about the parameters using the posterior distribution of the parameter values. The Bayesian approach is different than the classical approach, because parameters are treated as random variables with probability distribution. In this direction, for the parameter estimator, before analyzing the data, prior distribution is determined and it states uncertain information (for example, mean, distribution, kurtosis etc.) about the parameter.

For example, $\theta$ estimation is demanded by using a statistical model $y = \{y_1, \ldots, y_n\}$ that is defined with $p(y|\theta)$ density function. According to the Bayesian philosophy, as there is an uncertainty of distribution and probability explanations, $\theta$ cannot be completely determined.

The basis of Bayesian inference are defined by below steps:

1. A probability distribution for $\theta$, which is also known as $\pi(\theta)$ is formulated as prior distribution.

2. As $y$ is observation vector, $p(y|\theta)$ statistical model is selected to defined the distribution of $y$ as $\theta$ is given.
3. For the calculation of $p(\theta|y)$, posterior distribution, the data and the information obtained from prior distribution is combined together and beliefs about $\theta$ are updated.

These three steps require the use of Bayesian theory as it uses prior distribution which is on the way of the model given below:

$$p(\theta|y) = \frac{p(\theta, y)}{p(y)} = \frac{p(y|\theta)p(\theta)}{p(y)} = \frac{p(y|\theta)p(\theta)}{\int p(y|\theta)p(\theta)d\theta}$$

(1)

Here, $\int p(y|\theta)p(\theta)d\theta$, normalization constant for the posterior distribution. $p(y)$ is the marginal distribution of $y$. Probability function of $\theta$ is any proportional function of $p(y|\theta)$, so, $L(\theta) \propto p(y|\theta)$. Another way to write the Bayesian theory is below:

$$p(\theta|y) = \frac{L(\theta)p(\theta)}{\int L(\theta)p(\theta)d\theta}$$

(2)

Marginal distribution of $p(y)$ is an integral. As the integral is finite, it does not give an additional information about the posterior distribution of the integral. Because of this reason, $p(\theta|y)$ is written as a random constant in the proportional form given below:

$p(\theta|y) \propto L(\theta)p(\theta)$

As a simple definition, the Bayesian theory shows how to update an existing information with a new information. In the Bayesian approach, different than the classical approach that use data distribution for the parameter estimation, distribution of the each model parameter is used for it. $p(\theta)$ is used for starting as prior information, after the information is gathered from $y$, the beliefs about $\theta$ are updated and $p(y|\theta)$ is obtained. These are the basics of the Bayesian approach for the data analysis.

**Prior Distribution**

The prior distribution of a parameter is a probability distribution that involves the uncertain information about the parameter before analyzing the data. The prior distribution might be informative – subjective or non-informative, objective. If the non-informative prior is used, posterior density is similar to the probability function.

**The Problem of Prior Distribution Definition**

Different classifications may be made for definition, selection and or creation of a prior distribution. There are disagreements in the Bayesian approach caused by the selection of the prior distribution. In this regard, Bayesians may be grouped by their choices of the prior distribution.
After that, they may be separated according to the types of the prior distribution under this general frame:

The Classical Bayesians use non-informative prior distribution that does not give information as a proper prior distribution.

The Modern Parametric Bayesians prefer the conjugate prior distribution that have designed specifications.

The Subjective Bayesians select the prior information that is generally obtained from the expert opinions according to the previous impressions in a similar field.

**Uninformative Prior**

If a $\pi(\theta)$ prior has a minimum effect on the distribution of posterior distribution of $\theta$, it is an uninformative prior. Its parameter explanation power is very low. Also, giving the total uncertainty about the studied parameter with an uninformative prior it is not proper. In some cases, an uninformative prior might lead you to improper posteriors. Deductions are not made with improper posteriors. The uninformative priories are below:

- Flat, Uniform Prior Distribution
- Jeffery’s Prior Distribution
- Diffuse, Vague, Weak, Locally Uniform Prior Distribution

**Flat, Uniform Prior Distribution**

In flat prior distribution, similar probability value is assigned to the parameter in the defined interval; when $p(\theta) = c = 1$ $0 \leq \theta \leq m$, the parameter possibility is equal to $c$ within every point of the defined interval.

In general, it may be used in several situations such as the parameter is located in a defined interval, limitable and a rate in definition. Unutterable, it provides a complete uninformative distribution. For example, if the parameter is defined as $[0, m]$, as $m$ approaches to infinity, the prior distribution becomes less informative. However, in this situation, the probability of $\pi(\theta)$ approaches to zero. Gradually, $\theta$ does not have a possible value.

**Jeffrey’s Constant Prior**

This prior does not have big value out of the interval. Starting from the point of Jeffrey’s mentioned basic motivation, whether the parameter is limited to a defined interval or not,
(\(-\infty, \infty\) or \([0, \infty]\)) it equalizes the prior distribution to a constant. In this case, the defined proper prior distribution becomes inappropriate. Jeffrey’s prior is \(\pi(\theta) \propto |\mathcal{I}(\theta)|^{1/2}\). Here, \(|\cdot|\) shows the determinant, shows the Fisher information matrix for the \(p(y|\theta)\) likelihood function:

\[
I(\theta) = -E[\frac{\partial^2 \log p(y | \theta)}{\partial \theta^2}]
\]

(3)

**Vague Prior Distribution**

The position (average) and the shape (variance) hyperparameters of a parameter distribution is found. For instance, for the position parameter, a normal distribution, and for the shape distribution, gamma or inverse gamma distribution may be taken. Such values are assigned to the shape parameters of these distributions and they form a prior distribution which is positioned within a very wide interval, straight as the normal distribution, and uninformative. For example:

Big values are assigned to \(\sigma^2\), \(p(\theta) \sim N(\mu, \sigma^2)\).

Very small values (such as 0.001) are assigned to \(\alpha, \beta\), \(p(\alpha) \sim G(\alpha, \beta)\).

**Informative Prior**

An informative prior is effective on the posterior distribution without any constraints on probability. These priors may be information obtained from the old studies, previous experiences and an expert opinion combined with the current information naturally.

**Conjugate Prior**

If both prior and posterior distributions are from the same family, it is stated that the prior is a conjugate prior for the family of distribution.

**Point Estimate**

Bayesian estimation is a classical method together with the maximum likelihood estimation or the method of moment estimation methods. Conversely, the Bayesian approach uses the posterior average. The expected value of the posterior distribution is the Bayesian estimator of the parameter. The definition of the posterior distribution is given as below:

\[
E(\theta | y) = \int \theta p(\theta | y) d\theta
\]

(4)

And the posterior mode is the defined value of \(\theta\) which is the maximum for \(p(\theta | y)\). The variance of the posterior density defines the uncertainty in the Bayesian approach. The Bayesian
analysis uses the posterior variance or the posterior standard error to characterize the distribution of the parameter.

**Confidence Intervals**

Bayesian interval estimations are defined as belief intervals. The posterior distribution is given as \( p(\theta | y) \), if \( P(\theta \in \mathbb{A} | y) = \int_{\mathbb{A}} p(\theta | y) d\theta \), the belief intervals for \( \theta \) is \( \mathbb{A} \).

Evenly spaced interval for \( 100(1 - \alpha)\% \) corresponds to \( 100(\alpha/2) \) and \( 100(1 - \alpha/2) \) th percentages. It is the Bayesian belief interval that is defined as the highest posterior density (HPD). It is showed that, Posterior probability of the area is \( 100(1 - \alpha)\% \) and The minimum density of a point within the area is bigger or equal to the density of a point out of the area.

In the Bayesian approach, for the mean of the posterior distribution, for example, if 0.95 confidence level is mentioned, the probability that this interval contains the mean of the posterior distribution – which is also the mean degree for the belief degree is 95%.

**Markov Chain Monte Carlo Method (MCMC)**

The Markov Chain Monte Carlo method (MCMC) is a simulation method for the calculation of the posterior amount and sampling from the posterior distributions. As each sample is dependent on the previous one, a Markov Chain notation is valid here. A Markov Chain is \( \theta^1, \theta^2, \ldots, \theta^t \) series of the random variables created by the \( \theta^t \) random variables dependent on the previous \( \theta^{t-1} \) random variable. As a mechanism that approaches to the target distribution randomly without a memory, it is considered as sampling application of a Markov Chain. The future movement of the mechanism is dependent to the movement of the current one here.

The Monte Carlo integral is used as an expectation approach with the Markov Chain samples. It is defined as below:

\[
\int_S g(\theta) p(\theta) d\theta = \frac{1}{n} \sum_{i=1}^{n} g(\theta^i)
\]

Here, if \( g(.) \) is a significant function and \( \theta^i \) are samples of \( p(\theta) \) from the S mass. This approach is the expected value of \( g(\theta) \).

The Markov chain method is pretty useful for the modern Bayesian calculation. You may define short inferences and the analytic form of the posterior distribution with the simplest Bayesian models. With the MCMC method, it is possible to produce samples from the \( p(\theta | y) \) random posterior density and using these samples for the approximate values of the interested amounts.
Metropolis and Ulam (1949) and Metropolis et al. (1953) defined the Metropolis algorithm. Hastings (1970) generalized the results of Metropolis-Hastings algorithm. Geman and Geman (1984) used Gibbs sampling to analysis imagery data. Tanner and Wong (1987) are the first people who presented the general use of MCMC method in statistics literature.

**Metropolis-Hastings Algorithms**

The Metropolis-Hastings Algorithm is simple and practical and it used to obtain random samples from any arbitrary complex target distribution in any dimension and it is also known as the normalizing constant.

Assume that \( q(\theta_{new}|\theta^t) \) is a symmetrical distribution. The proposed sampling distribution should be an easy distribution, so, it should be \( q(\theta_{new}|\theta^t) = q(\theta^t|\theta_{new}) \) that has the same signification with the possibility of obtaining \( \theta_{new} \) from \( \theta^t \) and the possibility of obtaining \( \theta^t \) backwards from \( \theta_{new} \). The most common selection of the proposed distribution is a normal distribution with a constant \( \sigma \) with \( N(\theta^t, \sigma) \) The Metropolis algorithm is summarized as below:

1. \( t = 0 \) and the starting point \( \theta^0 \) should be selected. This point is arbitrary since \( f(\theta^0|y) > 0 \).
2. The proposed distribution should generate a new \( \theta_{new} \) sampling by using \( q(\theta^t) \).
3. Below value should be calculated:
   \[
   r = \min \left\{ \frac{f(\theta_{new}|y)}{f(\theta^t|y)}, 1 \right\} \quad (6)
   \]
4. \( u \) sample should be obtained from the normal distribution of \( U(0,1) \).
5. If \( u < r \), \( \theta^{t+1} = \theta_{new} \), otherwise, \( \theta^{t+1} = \theta^t \) should be used.
6. When \( t = t+1 \) is used, if \( t < T \) (\( T \) is the number of demanded sampling), you should go back to the step 2, otherwise, the procedure is stopped. Number of iteration is stopped when the proposed sample is accepted.

**Gibbs Sampling**

The Gibbs sampling is a special condition of the Metropolis and Metropolis-Hastings algorithm in case of the posterior conditional distribution. The Gibbs sampling requires separation of the integrated posterior distribution in the full conditional distribution for each parameter and their samples in the model. The Gibbs sampling proceeds as below:

1. Take \( t = 0 \) and an arbitrary \( \theta^{(0)} = \{\theta^{(0)}_1, K, \theta^{(0)}_k\} \) starting value is selected.
2. Each component of $\boldsymbol{\theta}$ is produced as below:

Find $\pi(\theta_1 | \theta_1^{(i)}, K, \theta_k^{(i)}, y)$ from $\theta_1^{(i+1)}$ bul.

Find $\pi(\theta_2 | \theta_2^{(i+1)}, \theta_3^{(i)}, K, \theta_k^{(i)}, y)$ from $\theta_2^{(i+1)}$

Find $\pi(\theta_2 | \theta_1^{(i+1)}, \theta_3^{(i)}, K, \theta_k^{(i)}, y)$ from $\theta_2^{(i+1)}$

............... 

Find $\pi(\theta_k | \theta_1^{(i+1)}, K, \theta_{k-1}^{(i+1)}, y)$ from $\theta_k^{(i+1)}$

3. Take $t = t + 1$ and if $t < T$ (T is the desired sampling span), you should go back to the step 2. Otherwise, the procedure is ended.

Example

In this study, the data set is obtained from the study made by Besballi and Ozturk (2017) which is related to the economic contribution of Artvin Coruh University in Turkey. The consumption function is created with both the classical approach and the Bayesian approach. SAS 9.3 software is used and the modules are Proc. Reg for the classical analysis and Proc MCMC for Bayesian analysis. The consumption function is defined as non-intercept in the Bayesian analysis to decrease the number of the prior information.

$$C_t = \beta Y_t + \varepsilon_t, \quad t = 1, 2, ..., 1438$$

$C$ indicates consumption and $Y$ indicates income here.

The model estimations obtained by the classical analysis are below:

| Variable | Parameter Estimate | Standard Error | t Value | Pr > |t| | F |
|----------|--------------------|----------------|---------|--------|--------|--------|
| income   | 0.76616            | 0.01017        | 75.36   | <.0001 | <.0001 |

And the model is obtained as below:

$$C_t = 0.766Y_t + \varepsilon_t$$

$\beta$ should be within $[0,1]$ interval due to the assumptions of the consumption function. According to that, for $\beta$, which is the unknown parameter of the consumption function in Bayesian analysis, uninformative uniform prior distribution is used.

As the studies in the literature are taken into consideration (see. Besballi and Ozturk (2017)), the mean is taken between 0.45 - 0.95, and the variance is taken 0.001 and 0.0001 to obtain $\beta$ posterior estimation, so the results are below:
In Table 3, the parameter value of the consumption function, which is marginal propensity to consume is 0.766 and the standard error is 0.0017. Both the parameter and the model are significant. Different prior information leads different posterior estimations. The posterior mean is obtained between 0.751 – 0.783 from the different prior information in Table 3. Including classical estimation value to the prior information increases the precision of the posterior estimation. The posterior standard error is lower than the result of the classical analysis.

**Conclusion**

In economy and the business world, the Bayesian approach may be used with the classical approach to make decisions in different conditions. Different than the data base-only inferences in the classical approach, the Bayesian approach gives an opportunity to interpret by adding previous information or expert opinions to the data. It helps to obtain much accurate results in economy and the business world. Because of this reason, including the Bayesian approach to the applied econometrics world leads profitable results. It may be included to an inference by the help of a prior in case of economic constraints. It is easier to find solution to complicated problems with the Markov Chain Monte Carlo estimation method and it works efficiently with big data as well. This study offers an insight into the process of the Bayesian approach, why the Bayesian approach should be used, its differences, advantages and disadvantages from the classical approach for the researchers studying in econometrics and different disciplines. The different posterior means are obtained between from the different prior informations. Selection of prior information is important and classical estimators can be used as prior information for the Bayesian approach.
References


USAGE OF THE STATISTICAL APPROACHES IN ECONOMETRICS

Zeynep ÖZTÜRK


Appendix

SAS 9.3 Code For Classical Analysis
ods graphics on;
proc reg data=work.cons;
model consump = income/ noint ;
run;
ods graphics off;

SAS 9.3 Code For Bayesian Analysis
ods graphics on
proc mcmc data=work.cons seed=27500 ntu=5000 nmc=20000 thin=10 dic diagnostics=all;
outpost=consout ;
parms beta1;
prior beta1 ~ normal(0.45, var=0.001);
p=beta1*income;
model consump ~normal(p, var=10000);
run;
ods graphics off;
PART III

PUBLIC FINANCE
Introduction

The financial crisis of 2007 is one of the greatest crises in the history of capitalism. According to the Marxian crisis theory, the Eurozone crisis is not only a debt crisis or a financial crisis but also it is definitely a crisis of real economy. However, it exhibited itself in the form of a debt crisis, especially a public debt crisis.

The evidence shows that peripheral countries like Spain, Portugal, Greece, Ireland are heavily indebted and the composition of the debt varies among Spain, Portugal, Greece, Ireland. The most prominent creditors to these countries are the core countries. When the threat of falling into default position increased, the European Central Bank (ECB), the International Monetary Fund (IMF), the European Union (EU) and the Federal Reserve intervened into these peripheral economies using various means. For example, the ECB and the Federal Reserve provided liquidity to core banks for lending to peripheral countries. This step paved the way for windfall profits for the banks of the core countries, but the debt of the peripheral countries also increased. At the same time, funding problems and credit risk were aggravated. The European Union and the IMF announced several rescue packages for peripheral countries. The rescue packages contained austerity plans, privatizations and several neoliberal reforms for the peripheral countries, so the peripheral country took burden of the crisis and the financial crisis became a public debt crisis.

The contradictions of capitalism and the role of the state in capitalism are more important issues that need to be investigated to understand the current public debt crisis, but we have tried to do this with a historical perspective on public debt in the paper. This kind of analysis is also important to find a solution. Therefore, the main aim of the paper is to look at the genesis of public debt. Firstly, the paper will explain the short panorama of the currency crisis and how the crisis becomes public debt crisis. And secondly, the study will go back and try to explain how kings’ debts became public debt and what is the meaning of this transformation.
In conclusion, the relation between public debt history and the events of the current public debt crisis will be explained.

**Current Financial Crisis**

When the liquidity crisis began in the mortgage housing market in 2007, Lehman Brothers, Black Rock, AIG and many other financial institutions collapsed in 2008. The US and the British financial system defaulted. This financial crisis also affected Europe. Financial panic in central capitalist countries has also affected trade and investments by causing a general economic contraction in 2009 (Albo and Evans, 2011: 312). How does the crisis break out in Euro area?

The Eurozone crisis looks like a debt crisis, but it is a result of imbalances within Europe. Because of Germany’s current account surplus, gained by lowering its labor cost, the European Union has been divided into two center countries (Germany) and periphery countries (Spain, Portugal, Greece). The periphery countries are indebted because of their weak competitive positions in and advantage of borrowing in the Euro area. Public, private sectors and household have borrowed increasingly (Lapavitsas vd, 2010a).

The exposure of core banks to peripheral countries have increased permanently in the Euro area. Even the financial crisis hit the European Union in 2007, the exposure of core banks increased. The lender banks had no worry about the government solvency (Lapavitsas vd, 2010b: 40). Furthermore, European Central Bank continued supporting all banks. The greater exposure to peripheral countries issued from Germany and France (Lapavitsas vd, 2010b: 40).

When the European banks understood their assets were in danger and interbank market froze, European banks needed the liquidity. Because of the banks heavy pressure, “ECB decided to increase its longerterm refinancing operations. The expectation was that this would re-establish confidence in the money markets, as well as inducing banks to lend more freely beyond the interbank market” (Lapavitsas vd, 2010b: 43).

European banks decreased their short-time securities, so ECB increased its long-term finance. And european banks preferred to hold some of their reserves at the central bank, not to lend their deposits. This process damaged the economy with decreasing the supply of credit (Lapavitsas vd, 2010b: 40).

When the financial crisis hit the USA banks, The Federal Reserve first introduced the idea of a $ 700 billion emergency plan to be used in the purchase of mortgage-backed securities, which they called the toxic dumps they held in the hands of financial institutions, and with the increase in financial panic, the Federal Reserve had raised commercial papers in the $ 1.3 trillion market the short-term debts they have drawn up) are all ready to become buyers. All of the G-7 forces, the United States and Great Britain have announced that they will buy some
of the shares of the banks in order to inject capital directly into the banks, that is, they will do some kind of expropriation. Later, it was announced that the financial recovery package in the United States would be $ 5.1 trillion (Foster and Magdoff, 2009: 18-19)

“The immediate cause of the sovereign debt crisis is now clear:”

“….states have had to issue enormous amounts of debt at the worst time, thus facing increases in yield. Banks reduced their lending in 2009 and switched to holding short term securities. They also avoided issuing bonds in 2009, fully aware of the rising pressure in financial markets, and opting to issue equities. The stock market revived in 2009 due to government support for the financial system, thus banks could obtain funds cheaply. Non-banks were able to issue fresh debt at yields similar to the previous period because they have more flexible term structure and timing of issuance. The brunt of the crisis has been shifted onto public sector” (Lapavitsas vd, 2010b: 45).

The bigger exposure of peripheral countries was given by Germany, followed by France, Britain and the US banks (Banco de Portugal, 2017). The largest share of German banks’ exposure is held by KfW which is a state-owned bank, other exposure banks of Greece are Deutsche Bank and Commerzbank. According to the JP Morgan study, French bank Credit Agricole was the most exposed of Europe's commercial banks. France's largest bank, BNP Paribas and Societe Generale are other lenders of Greece (Reuters, 2015). According to the Central Bank of Portugal “there is a strong integration between the Spanish and the Portuguese banking systems. Recent consolidation trends within the European Union will possibly reinforce this integration. As such, it might be interesting to focus in more depth on the transmission of regulation implemented in Spain” (Banco de Portugal, 2017).

In order to save the markets from collapse, the financial crisis has turned into a public debt crisis by "supporting the mortgage markets, transferring capital to bankers, expanding applications in monetary and fiscal policies" (Albo and Evans, 2011: 312).

For example, public debt in Ireland has soared from 42.4 percentage of GDP to 120 percent of GDP between 2008 to 2013. More over, Ireland had huge private debt about 306 percent of GDP in 2015. Greece's public debt has increased 80 percent of GDP between 2008 to 2016. Greece total debt is about 300 percent of GDP. Italy, Spain and Portugal have huge total debt like other Euro periphery countries.

For example, the public debt/GDP ratio in Ireland soared to 120 percent in 2013 from 42.4 percent in 2008. And also Ireland had huge private debt/GDP ratio, reaching 306 percent of GDP in 2015. Greece's public debt increased about 80 percent of GDP from 2008 to 2016. Greece's total debt is about 300 percent of GDP. Italy, Spain and Portugal have huge total debt like other Euro periphery countries (Eurostat, 2018a).
As Altvater indicates, under normal conditions the statea are desired debtors, because states always have tax revenues different from companies profits. There is a danger if the interest rates has a great share in total debt stock. Of course, there is always a solution like Euro Central Bank member says: “Greeks have lots of lands to reduce her debt” (Altaver, 2012, 298-299).

Namely, undesired debtors became desired debtors by state intervention in the current crisis. And European Commission, the IMF and Euro Central Bank said the people to pay banks’ debts with bailout programmes with austerity measures.

For example, in Medium Term Fiscal Strategy 2011-2015 Greece, Ministry of Finance proposed 2011-2015 austerity measures that contains a total expenditure cut which was 6,1 percent of GDP and total income measures were 6,0 percent of GDP and total austerity measures for 2011-2015 were 12,1 percent of GDP. Ireland government decided to reduce the current expenditure back to 2007 levels.

Ireland government decided to reduce the current expenditure back to 2007 levels. Spain government announced that total austerity measures were 7.2 percent of GDP for 2011-2014 period. The bulk of the expenditure cuts was related with health care spending and wage cuts. On the revenue side, austerity measures focused on VAT and income tax increase, and the health spending cuts were in the first place of the expenditure side measures.

Spain government announced that total austerity measures were 7.2 percent of GDP for 2011-2014 period. The bulk of the expenditure cuts was related with health care spending and wage cuts. On the revenue side, austerity measures focused on VAT and income tax increase, and the health spending cuts were in the first place of the expenditure side measures.

Portugal’s total austerity measures for 2011-2013 was 10,6 percent of GDP. The expenditure cuts was the central of the austerity plan with 70 percent of total measures. As others, the health expenditure, public investmentand public servants expenditure cuts were in central of the plan. On the income side VAT and excise have increased (Taşdoğan and Ağdemir, 2014).

After ten years from financial crisis, the austerity plans have been implemented without bailout programmes. For example, Greece approved the country for the latest international bailout in 2015 that is due to expire in August and then for 2018 government declared austerity programme will be continued. Even if some contries like Portugal and Spain declared rejecting austerity programmes, their balanced budget aim is not different from austerity measures. Public or private debt, unemployment rate, youth unemployment rate of periphery countries have soared even if the periphery growth rate is not negative. On the other hand Germany’s biggest lender Deutsche Bank announced “suprisingly” projected profits of around €700 million for the second quarter of 2018 (DW, 2018b).

---

1 Data from DW, 2018a.
2 Data from Eurostat (2018a; 2018b; 2018c).
From Ancient Debt to Public Debt

In the early modern period, public borrowing was in two forms that are short-term debt and forced loans from wealthier people. The more modern forms of borrowing were borrowed from the banks of the Italian city states cities in various ways. The debts from the banks were proceeding with agreements, regardless of the law of the kingdom like England borrowed from the Italian city states during the Hundred Years’ Wars.

However, the disadvantage of these debts borrowed from the banks was that it had high interest rates. As such, the king became insolvent and rejected the debts. Apart from that, the kings were able to borrow from foreign banks instead of borrowing from their own subjects. This was obligatory borrowing. In Venice in the 13th century, they had to pay some of their movable fortunes to the state. The advantage of such borrowing was that it had low interest rates. But in this way the money-holders could get rid of their obligations without losing their money.

The kingdom could refuse the debt and imprison the people they borrowed with various punishments. For example, the deportation of Jews by King Edward I of Great Britain would have made it possible for both the debts to be paid and for Jewish assets to be seized (Stasavage, 2003: 51). The same occurred in England, when Edward III refused his debts, after his Florentine bankers Bardi and Peruzzi failed. In 1672, lots of bankers went into bankruptcy when Charles II defaulted (Kim, 2012: 13).

Nicolas Fouquet, who is the bankers of XIV, Louis, was sentenced to life imprisonment, after he welcomed the king in his own chateau in 1661, so that the Sun-King’s financial dependence was lifted. Fifty unfortunate large financiers, who were in charge of finance of managing large capital in France, lost their lives by being exposed to the most violent hardships between 1746 and 1826 (Jamgoçyan, 2013: 88).

The Ottoman pashas had borrowed money from sarrafs, and in return, they had given them privilege such as getting the right to lend money for Ottoman Empire army needs. It was a relationship where both sides had an interest. However, some of the pashas were slanderous and blamed sarrafs and by this way they got rid of their debts. In 1765, Stavraki who is the sarraf of III. Mustafa was executed in front of the palace for exposing the secrets of the palace. In 1758, the Ottoman Grand Vizier Koca Ragip Pasha’s three sarrafs were captured and were released after giving a part of wealth (Jamgoçyan, 2013: 86-87). I also have to say that lending the kings is extremely profitable as long as the kings pays their his debt. Thus, we cannot afford to overlook “Strozzi bank heavily involved in managing state finance in Aragonese Naples; or the Medici lending to the Duke of Milan” (Pezzolo, 2008:18).

In the 13th century, the Venetian state’s failure to pay its debts brought new ideas to the agenda (Stasavage, 2003: 51). The short-term nature of taxes not being popular and causing unrest has
encouraged new ideas about state spending and government borrowing by alternative financial means of state finance (Konzelmann, 2012: 4-5).

Long-term debt financing with taxes has emerged in the earliest Italian cities. Venice has declared its willingness to bond with the long-term borrowed customs taxes at a rate of five per cent in the 13th century. Thus, in the 14th century, Venice was able to pay these debts in the long run, and it was possible for debts to be traded in the secondary market. Geneva has gone even further than this and has united debt institutions to make it easier to control taxes on debt. Despite the fact that it was costly to remove taxes for the Genoese government, it provided for the continuity of taxation and the payment of debts while the government changed the contracts (Stasavage, 2003: 51-54).

Public debts could be made in the city states because the creditors had control over the taxes. The system in Italy spread to the Netherlands (Nogal and Chamley, 2014: 193).

The public debt in the Holland region has been controlled by law in a modern sense by Spain Holland. The Habsburg Empire, which started this revolution was in a war with France. The king borrowed from the Antwerp money market, after a while, the monarchy became an unreliable debtor, Antwerp closed to the king. In 1522, V. Charles demanded from provincial estates to sell government securities financed by a specific future tax revenue. By this, the obligations of the debts guaranteed by not the central state but by local administrations. When war was repeated in 1542, this time the debts were starting to be backed by all tax incomes, not only a specific tax. Thus, debts are responsible for all incomes of regional governments (Stasavage, 2003: 55-56).

As Marx said, the debts backed by taxes, increased the sovereignty of the banks over the state:

“The credit associations established in the 12th and 14th centuries in Venice and Genoa arose from the need for marine commerce and the wholesale trade associated with it to emancipate themselves from the domination of outmoded usury and the monopolization of the money business. While the actual banks founded in those city-republics assumed simultaneously the shape of public credit institutions from which the state received loans on future tax revenues, it should not be forgotten that the merchants founding those associations were themselves prominent citizens of those states and as much interested in emancipating their government as they were in emancipating themselves from the exactions of usurers, and at the same time in getting tighter and more secure control over the state. Hence, when the Bank of England was to be established, the Tories also protested: “Banks are republican institutions. Flourishing banks existed in Venice, Genoa, Amsterdam, and Hamburg. But who ever heard of a Bank of France or Spain?” (Marx, 2010[1894] 448).
And the 1688 Revolution created a new personality of the state and “sovereign debt was no longer of the crown, but public debt, the debt of people this innovation, increased the government’s credibility in regards to its debt obligations” (Kim, 2012: 13).

It is not coincidence that England public debt and imperial power went up after the 1688 Revolution as O’Brien and Hunt said:

“The institutionalization of public debt was but one symptom and sinew of a combined financial, fiscal and naval strategy for the projection of British power overseas. State debts could only be accumulated, sustained and serviced by revenues from taxation assessed and collected with difficulty from the realm’s evolving but narrow fiscal base and recalcitrant bodies of taxpayer-swar, the innovations of a republican regime and the construction of relatively efficient institutions for the assessment and collection of taxes (particularly excise and customs duties) under the restored Stuart monarchs, together with sustained support for a standing navy – have all been analysed by a recent wave of historiography as ‘preconditions’ for the rapid (and, in European terms, extraordinary) accumulation of public debt that succeeded the change of monarchical regimes in England in 1688” (O’Brien and Hunt, 1995: 179-180).

By an act of 1665, additional aid had been imposed to finance debts and after III. William had implemented a new rule that was approved additional tax for paying debts in case of one tax could be inadequate to pay debts. William had given lender better security with this implementation. Also, this was an important step toward the modern public finance system. These principles tied debts to particular taxes (William, 1999: 17-18). “The institutionalization of the debt also brought about an important process of socialization of the debt”. By this aspects, “citizens became true lender-taxpayers rather than lender-investors”. “As long as state finance was not under severe and extended pressure, the system represented a ‘moneylender’s paradise’ ” (Pezzolo, 2008: 19).

As Marx (2010[1894]) said, one of the important aim of banks is getting tighter control over rulers to finance their debts. In 1694, the real paper money was emerged with establishment of the Bank of England. These notes were not billed. The root of this money was based on the debts of the king for war. The money was not a loan to be paid to the king, but the reverse payment of the king is a necessary debt. The Bank of England consisted of forty London merchants and Edinburgh merchants who had already lent to the king. This consortium offered 1.2 million pounds of credit for the fight with France. On the other hand, they accepted the king’s right to issue banknotes to show that the king owed them money. Then the bank became a clearing house between small banks and the banknotes became the first national paper money in Europe (Graeb, 2015: 354). As Dyson said:

“The British Parliament and the new central bank helped secure the interests of self-made and inherited wealth. They protected these social interests from threats of default and coercive
financial repression. The new mechanisms that safeguarded sovereign creditworthiness served also to strengthen incentives to entrust self-made and inherited wealth to new banks and later to investment trusts” (Dyson, 2014).

Unlike Britain, in France, the Crown’s credibility problem was not solved by representative institutions. In Britain, Tax Farming disappeared in 1641 with the Glorious Revolution, formal representative institutions like the Bank of England and a strong Parliament were in place to ensure that the government behaved credibly on the capital markets (Johnson, 2006: 15). It is very critical to note that the subordination of interest bearing capital in England was earlier than other countries.

In France, during the eighteenth century the Company of General Farms provided forty percent of tax revenues and was one of the most important creditors of the Crown. After General Farm system that is allocated form of all tax farms, emerged in the seventeenth, Crown debt soared. The king borrowed 244 million livres tournois about a quarter of long term debt from General Farm (Johnson, 2006: 3-5). In 1764, half of Crown debt was borrowed from General Farm and General Farm became the main lender of Crown (Johnson, 2006: 14).

It is also very critical to note that there was great relation between state finance and financiers as Marx said:

“The really important and characteristic domain of the usurer, however, is the function of money as a means of payment. Every payment of money, ground-rent, tribute, tax, etc., which becomes due on a certain date, carries with it the need to secure money for such a purpose. Hence from the days of ancient Rome to those of modern times, wholesale usury relies upon tax-collectors, fermiers généraux, receveurs généraux” (Marx, 2010 [1894]444).

There were lots of examples about financiers were also important tax farmers. For instance, in sixteenth century Castile, lots of members of Diego de la Fuente family controlled the silk trade for several decades and some of them were tax farmers. It is very important to analyse financiers to understand government debt. Taxes depended on merchants because they “linked credit, loans, farm taxes and collection in their own businesses”. When financiers could collect taxes (March, June, August and December), these times were also the months that loans were paid. And for financiers, “the loans to the government were a good opportunity to increase their credit through repayments and direct control of taxes” (Garcia, 2018: 34: 36).

When it comes to 1800, few nations other than England had achieved the capacity to build up significant international debts (Reinhart and Rogoff, 2010: 70). After the French Revolution and Napoleonic wars, a period of financial chaos began, and the result was bankruptcy with the exception of Britain (Macdonald, 2003: 359).
The Napoleonic Wars and post-1815 period had demonstrated that it was very critical for victory to have greater capacity to expand public debt and England had a bigger capacity than Austria, France, Prussia, and Russia. The reasons of this achievement had to do with “the creation of professional institutions to manage the public debt; the shift of public financing from ad hoc short-term loans to secure long-term borrowing; the spread of public debt amongst a much larger number of creditors; and tough, consensual measures of financial repression that privileged public over private debt” (Dyson, 2006: 181).

After a decade later the Napoleonic Wars, the Netherlands and Austria and in the later nineteenth century Germany and Italy were established their central banks, Bismarck founded the Reichsbank in 1871, and in 1893, the Bank of Italy (Macdonald, 2003: 354). In 1853, The Ottoman Empire accepted non-judicial execution of the shareholders', not to confiscate the fortunes of partners with the establishment Bank-ı Osmanlı for the purpose of recovery of the Ottoman finance (Jamgoçyan, 2013: 109).

And with nineteenth century and twentieth century, modern public finance system and its mechanism had been completed. And when the debts were no longer paid, all the taxes were seized easily.

**Conclusion**

The taking control of a specific tax revenue for paying debts was a genius solution that is found by bankers in case of the possibility of refusing kings’ debt. The next step for bankers to collect their debts was controlling not only a specific tax, but all tax revenues of the state. The state finance had already been lucrative, and with this step loans to the governments became more profitable for lenders. Namely, with the institutionalization of public debt, opportunity to increase profit of the lenders have been guaranteed by the state. The Italian city state first made public debt for this reason. British Empire had the capacity to get international debt, because he guarenteed paying debts with institutionalization of public debt. The emergence of Bank of England was the part of institutionalization of public debt. So that, the genesis of the public finance is taking control of state revenue by financiers. Even if countries are under severe conditions, the debt will be paid by people throughout several years.

Even when 2007 financial crisis began, the states and central banks contunied to lend, because they know that “the taxes are a great guarantee of financiers profits regardless of whose the debt it is, as the idea on the origin of public debt. After the current crisis, the European people have paid private debts by public debt mechanism, the public debt behaved more merciless than Molière’s Harpagon who does not make loans even to his own son, even if he gets his money stolen tries to collect money from whoever finds and the exploiters of debtors.
After the current crisis, we should remember that state finance have been a most profitable vehicle for financiers since ancient times. And also, the genesis of the public debt is giving the lenders more security to pay debts. When it comes to late capitalism that is the stage of the role of the state has expanded and the capital accumulation has accelerated, it is quite expected that public finance will pay the bills of failure of banks. The most interesting issue is that missing the genesis of public debt and trying to overcome the current crisis without rejecting the obligatory mechanism of debts. It is impossible to implement public friendly policies without rejecting the obligatory mechanism of debts, so the genesis of the public debt idea is the idea of seizing public revenues.
References


Graeber, B. (2015), Borç: İlk 5000 yıl, Everest: İstanbul.


**Other References**


Introduction

Poverty is a concept as old as the history of mankind. Failure to meet the needs of a humane life is the simplest situation that causes poverty. Lack of accommodation, malnutrition, access to health services, poor education are nowadays defined as the elements of poverty. Policies that would reduce poverty and drive society away from poverty risk are the leading focal points of governments all around the world. Therefore, an increase in social welfare would be ensured accordingly.

There is an extensive collection of literature on poverty measurement methods under the heading of poverty alleviation. Identification of poverty in the first place becomes crucial regarding the determination of the socio-economic characteristics of the poor and the development of solution proposals. Besides the absolute poverty lines introduced by the World Bank in general, different definitions such as relative poverty have also been developed, in the sense that poverty being not fully reflected. Material deprivation is one of them. This concept, which is designed to determine the ones exposed to poverty risk while not being poor, takes income and living standards of the households into consideration. Thus, the possibilities of encountering social exclusion or being below the poverty line for households would be evaluated. The concept of material deprivation in Turkey is tackled by the study. Using the TURKSTAT Income and Living Conditions Survey data obtained for the period 2006-2016, the change in the indicators and rates of material deprivation is analyzed. In this context, poverty concept and its measurement methods are examined, and then the material deprivation situation for Turkey is discussed.

Poverty

Many different definitions of poverty appear in the literature. Considering poverty merely as having a low level of income would only reflect a single aspect of the pain suffered. For instance, the concept of health is defined by the World Health Organization (WHO) as “a state of complete physical, mental and social well-being of the individual, and not merely the absence of illness or disability” (WHO, 1948). The comprehensive definition emphasizes that poverty, unemployment, income distribution, suppressive cultural rules and family relations, repressive
political regimes, and warfare have direct impacts on the “state of well-being” (Çelik, 2011: 26). Therefore, health is defined as the well-being of the individual which influences access to health services along with a wide range of environmental factors such as accommodation, education, income, family conditions, occupation, personality, spirituality, religious beliefs, individual security, public health, air and noise pollution (Slater, 1999: 56-59). As a matter of fact, sometimes health is used as a variable to explain time, wages, efficiency, academic performance, productivity and demand for medical care (Rout and Nayak, 2007: 14). In this context, being healthy is an important status also accompanied by not being poor. Sickness would cause people to fall into poverty, as much as it is possible that poverty would cause people to fall into sickness. The strong link between health and poverty is also highlighted in the World Development Report 2000/2001. This link can be traced back to the Victorian era in England regarding rapid industrialization and public health (Mowafi and Khawaja, 2005: 260-3). Accordingly; poverty, in general, connotes the struggle to make a living and economic hardship. Not being able to attend school, to receive health care, to benefit from heating, to enjoy good nutrition, and to find accommodation or sheltering are among the main economic problems related to poverty.

Poverty, in the simplest sense, is defined as “the lack of income level to provide necessities such as food, drinking water, housing, and toilets.” Adam Smith expresses this situation in the following sense: “all people are rich or poor to the extent they can find facilities to benefit from necessary, available and favorable objects for human life” (Smith, 2006: 31). According to the United Nations, poverty is basically the lack of choice, opportunities, and the capacity to participate effectively in social life as well as the violation of human dignity. This means that there is no school or health clinic to go to with competent nutrition and clothing, no job that can provide food or a place to live, and access to credit facilities. It is insecurity, weakness and social exclusion of the individual from household and the society. It is living in marginal or vulnerable environments without any access to clean and healthy drinking water and exposure to violence (UN, 1998). At the World Summit for Social Development held in 1995 in Copenhagen by the United Nations, certain commitments have been made to ensure that poverty is considered as a threat for which the whole world must be well-prepared in order to eliminate it. It is also stated that the utmost importance should be given especially to women and children along with the ones with disabilities who suffer the heaviest burden of poverty (UN, 1995).

The World Bank describes poverty as “pronounced deprivation in well-being.” Accordingly, the conventional view associates well-being with sovereignty over commodity and defines the poor as those who do not have any income or afford any consumption above the threshold of a minimum standard of living. So, this approach mostly perceives poverty in a monetary sense. In this context, poverty can attain different aspects such as home poverty, food poverty or health poverty. Can they gain access to food, health, or education at a competent level? The answers to these questions would undoubtedly cause poverty to extend beyond the monetary point of view.
The concept of well-being expressed by Amartya Sen relates poverty with the ability of the individual in society or, in other words, his/her capability. Thus, poverty is directly related to the difficulties faced by the individual who has insufficient income or level of education, inadequate health care, insecurity, and low self-esteem since they represent basic capacity indicators (Haughton and Khandker, 2009). K. Galbraith’s approach supports this situation. According to Galbraith, even if people earn income at the subsistence level, they are considered poverty-stricken when their income falls behind that of the society (Galbraith, 1998: 235). The British sociologist Peter Townsend supported this approach in his famous book entitled “Poverty in the United Kingdom” which described poverty as “deprivation of the individuals who lack nutrition, social activities, living conditions and facilities which are customary, or are at least approved in the communities to which they belong” (Townsend, 1979: 31).

**Measuring Poverty**

Knowing to what extent poverty has reached in society and which sectors are particularly affected make it necessary to measure poverty according to certain criteria. The determination of who is poor as well as to what extent they are poor would determine the direction of policies to be implemented and contribute to the ways through which social welfare can be further increased. In the literature, the idea of measuring poverty is basically comprised of four different parts. These can be listed as follows:

- a) Protection of the poor,
- b) Identification of the poor people in order to implement appropriate interventions,
- c) Evaluation of the projects by monitoring the interventions made toward poor people,
- d) Evaluation of the effectiveness of the aids aimed at helping poor people (Haughton and Khandker, 2009: 1).

Poverty definitions and measurement methods differ regarding the listed targets. In this context, it is seen that poverty is comprised of many dimensions such as economic, humanity, sufficiency, and health (Mowafi and Khawaja, 2005). The types of poverty commonly used for this purpose can be summarized as follows: Absolute poverty is generally defined as the inability of households to afford the minimum consumption necessary for maintaining their physical lives or not having a sufficient income to afford that consumption (UN, 1995). This approach focuses primarily on the “basic needs” such as nutrition and housing. The basic needs stated by Rowntree (1902) and Orshansky (1965) are the list of needs that are necessary to maintain each individual’s life. In this context, the households/individuals below the mentioned consumption/income level are poor. This criterion, accepted by the World Bank and referenced in its policy implementations, can also be regarded as the boundary of life since it represents the lowest level required for an individual to survive. So, in a sense, it provides the
simplest definition of poverty. The World Bank initially recognized the lower limit as $1, but then raised it to $1.25 in 2008 and $1.90 in 2015. Consequently, an individual with an average annual income of less than $700 per year is considered poor. This figure also allows for cross-country comparisons, and an attempt is made to create a universal poverty line. Nevertheless, some sectors asserted that the figure is disputable since the bank determines it. So, each country can set its absolute poverty line. For instance, in 2010, the absolute poverty line was assumed to be $15.50 for the United States, $1 for India and $0.55 for China, referring to the purchasing power parity of each country (Ravallion, 2010).

**Relative poverty**, however, focuses on the situation within the society in which an individual or household lives, and it is supported by A. Smith and Townsend who approached poverty as the lack of needs accepted by the society. In this context, upon considering the poorest segment of the population, these people are assumed to be the relatively poor (Haughton and Khandker, 2009: 43). As a result, according to the general structure of society, those who have income or consumption below a certain level are relatively poor. Despite the existence of different poverty definitions and limitations in the literature, the use of relative poverty line may contribute to the researchers even more. The most important reason for this is that absolute poverty lines do not allow relative comparisons for the population (Foster 1998; Zaidi, 1992; Pradhan & Ravallion, 2011; Ravallion, 1998). For instance, even though an individual may be above the absolute poverty line, one may also become relatively poor within the society. Accordingly, the relative poverty calculation is based on a certain proportion of the median income (e.g., 50%). Those individuals who are below the limit are relatively poor. Therefore, since this segment is at risk of falling below the poverty line, their situation must be carefully monitored by policymakers and protected against poverty.

There are various indications suggested in the literature for the calculation of the well-being of households as well as absolute and relative poverty concepts. They take different consumption patterns such as durable capital goods, home services, and wedding-funeral services into consideration. There is no consensus as to what extent income and expenditure are utilized in poverty measurement. It is seen that most wealthy countries use income, while most poor countries use expenditure for measurement. The main reason for this is the fact that it is relatively easier to calculate income in wealthy countries, while expenditure is relatively practical to estimate in poor countries (Haughton and Khandker, 2009: 20-30). Some studies focus on food, energy and health expenditures in the calculation of poverty (Raiz, 2006; Bloom and Canning, 2003; Salway et al., 2007; Najman, 1993; Saghir, 2005; Jaber and Probert, 2001; Eberhard, 1984; Kauffmann, 2005; Pachauri and Spreng, 2004).

**Material Poverty/Deprivation**

Worldwide poverty research studies usually focus on a variety of numerical boundaries. Those who are below the so-called boundaries live under the absolute poverty line and are included in the poverty calculations. For instance, income levels below $1 or $2 per day, commonly used
by the World Bank today, are generally accepted measures of poverty measurement. In this context, according to the bank, 1.85 billion people earned less than $1.90 per day in 1990, which decreased to 767 million people in 2013. The share of the poor in 1990 was 35.3%, then it went down to 10.7% in 2013 (UNDP, 2016). Therefore, the generally accepted approach in the framework of the Neo-Classical economic approach asserts that poverty has been decreasing all over the world. Nonetheless, it can be argued that this approach does not fully reflect the scientific truth. Considering those below the estimated figures under various assumptions as the poor means not only to ignore the definitions of poverty mentioned above but also to perceive poverty as a monetary phenomenon. Therefore, while one person is not included in poverty calculations when he earns more than $1.90 a day, it is thought that the person cannot comprehend all dimensions of poverty since his/her access to clean water, education and health services, his/her needs for accommodation and nutrition, and the ability to reach the minimum living standards accepted in society are ignored.

In order for the impacts of the implemented economic policies on the society’s well-being to be fully determined, different income distribution and well-being indicators are needed besides the numerical boundaries. In this context, besides income poverty, various concepts such as consumption poverty, social exclusion or poverty of opportunity are brought forward to determine poverty. On the other hand, the policies to be implemented in the struggle against poverty would be reviewed, and the chances of success in the struggle would increase with the determination of the households exposed to poverty risk. In studies carried out by the European Union on poverty and social exclusion, it is aimed to reduce the poverty rates by the strategy of the year 2020. In this context, it is planned to rescue at least twenty million people from poverty risk and social exclusion. Accordingly, material deprivation is defined as follows:

“Material deprivation refers to a state of economic strain and durables, defined as the enforced inability (rather than the choice not to do so) to pay unexpected expenses, afford a one-week annual holiday away from home, a meal involving meat, chicken or fish every second day, the adequate heating of a dwelling, durable goods like a washing machine, colour television, telephone or car, being confronted with payment arrears (mortgage or rent, utility bills, hire purchase installments or other loan payments). The indicator adopted by the Social protection committee measures the percentage of the population that cannot afford at least three of the following nine items; to pay their rent, mortgage or utility bills, to keep their home adequately warm, to face unexpected expenses, to eat meat or proteins regularly, to go on holiday, a television set, a washing machine, a car, a telephone. Severe material deprivation rate is defined as the enforced inability to pay for at least four of the items mentioned above. Persistent material deprivation rate is defined as the enforced inability to pay for at least three (material deprivation) or four (severe material deprivation) of the items mentioned above in the current year and at least two out of the preceding three years. Its calculation requires a longitudinal instrument, through which the individuals are followed over four years.” (EUROSTAT, 2018).

In a similar fashion, OECD defines the material deprivation in a similar fashion as “… referring to the inability for individuals or households to afford those consumption goods and activities...
that are typical in a society at a given point in time, irrespective of people's preferences concerning these items” (OECD, 2007). Material deprivation is distinguished from other poverty measurement methods since it takes into account the fact that households are able to carry out their basic expenditure at a level that can maintain their lives. The deprivation situations are determined by courtesy of the questions regarding the ownership of the various assets which have to be possessed at the minimum living standards. Therefore, a household well above the absolute poverty line may encounter material deprivation. In this case, income poverty is often accompanied by material deprivation. In that way, the risks of household vulnerability to long-term poverty are also determined. Goodman and Myck (2005) explained the use of material deprivation in poverty measurement as follows:

“We can use material deprivation as a proxy for long-term financial status… material deprivation seems to contain some additional information about a family’s financial well-being, over and above the information summarized in the level of current disposable income.”

Data and Methodology

The data used in the analysis of the dimension and development of material deprivation over the years are obtained from the Turkish Statistical Institute (TURKSTAT). Income distribution statistics carried out by TURKSTAT began to include income distribution from 2006 onwards as well as information on living conditions and social exclusion within the scope of EU harmonization studies. Accordingly, material deprivation, which expresses financial difficulties, includes information on unfavorable expenses along with ownership of washing machine, color television, telephone and automobile, weekly vacations, rent, housing loan, debt payments, meals with chicken, fish and meat every two days, and being not able to afford heating service in the study. The proportion of those who cannot afford at least four out of nine items mentioned above indicates a serious level of material deprivation. All locations in the Republic of Turkey are within the geographical scope of the datasets. The survey includes all household members who live in the households within the boundaries. The variables in the data set mainly focus on factors such as housing, economic situation, social exclusion, education, demography, health status, labor force and income level to calculate indicators of income, poverty, social exclusion and other living conditions. The data set of the study include the “Income and Living Conditions Survey” conducted for the years 2006-2016. The annual sample size is initially set at around 12,800 households, considering exacerbations of the sample regarding the estimated size, objectives, and targeted variables of the study. However, it is aimed to produce estimates based on the Classification of Statistical Region Units Level-2 in 2014, and the sample volume has begun to be increased with every new sub-sample added to the sample since 2011. Therefore, a total of 24,355 households are interviewed in the Survey on Income and Living Conditions 2016. A survey is conducted with 22,441 household respondents; while the remaining 1,914 households are not interviewed due to various reasons (TURKSAT, 2016). Descriptive analysis is used in the study.
Material Deprivation Indicators: An Evaluation over the Period 2006-2016

Poverty indicators are important in terms of the development of current income distribution and the distribution of welfare in a country. Along with economic growth, the change in social welfare can be easily monitored with the decrease in the proportion of those living under the poverty line. The proportion of individuals or households living under the line calculated by using the absolute poverty lines usually set by the World Bank is an indicator of the country’s welfare. In this context, one of the top priorities of almost all governments around the world is to reduce the poverty rate and to maintain a fair income distribution.

According to the poverty line determined by taking 50% of equivalised household disposable income into consideration by TURKSTAT, 18.6% of the population in Turkey lived below the poverty line as of 2006; then it decreased to 14.3% in 2016. There is no individual living below the $1.90/day level set by the World Bank. Thus, Turkey exhibits a positive performance along with the decrease in poverty rates. Accordingly, the material deprivation indicators for the year 2006 are listed in Table 1.

| Table 1: Material Deprivation Indicators of the Year 2006 |
|---------------------------------|-----|
| Material Deprivation Indicators | %   |
| Ownership of automatic laundry machine (No) | 11.51 |
| Ownership of color TV (No) | 1.94 |
| Ownership of cell phone (No) | 9.27 |
| Ownership of automobile (No) | 57.42 |
| Capacity to afford unexpected financial expenses (Cannot afford) | 68 |
| Capacity to afford to pay for a one-week annual holiday away from home (Cannot afford) | 85.93 |
| Capacity to pay rent, interest-bearing debt or mortgage loan as planned (Yes) | 9.63 |
| Capacity to afford a meal with meat, chicken or fish every second day (Cannot afford) | 60.07 |
| Capacity to afford to keep home adequately warm (Cannot afford) | 35.91 |

Source: 2006 Income and Living Conditions Survey, TURKSTAT.

Table 1 indicates the factors taken into account in the calculation of material deprivation using the data obtained from the “Income and Living Conditions Survey” conducted to examine the
basic living conditions of households. As seen in the Table, in 2006, about 86% of the households reported that they did not have the financing power to cover a week away from home. Therefore, a very large number of the households encounter and experience this problem. The second problem, which is felt at the highest rate, is the financing of unexpected expenditures. 68% of the households claim that they would not be able to resolve the extra financing difficulties that may arise in extraordinary circumstances. The rate of those who cannot consume food containing meat, chicken or fish every two days is quite high at 60%. The rate of those who do not own automobiles is approximately 57.4%, while the rate of those who claim that they cannot benefit from sufficient heating service due to financial reasons is about 36%. Upon considering the Gini coefficient by equivalised household disposable income, which is 0.428 in 2006, it can be argued that the social welfare is not distributed fairly within the context of the mentioned indicators.

**Table 2: Material Deprivation Indicators, 2006**

<table>
<thead>
<tr>
<th>Material Deprivation Indicators</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership of automatic laundry machine (No)</td>
<td>1.67</td>
</tr>
<tr>
<td>Ownership of color TV (No)</td>
<td>0.62</td>
</tr>
<tr>
<td>Ownership of cell phone (No)</td>
<td>0.65</td>
</tr>
<tr>
<td>Ownership of automobile (No)</td>
<td>40.98</td>
</tr>
<tr>
<td>Capacity to afford unexpected financial expenses (Cannot afford)</td>
<td>33.00</td>
</tr>
<tr>
<td>Capacity to afford to pay for a one-week annual holiday away from home (Cannot afford)</td>
<td>61.71</td>
</tr>
<tr>
<td>Capacity to pay rent, interest-bearing debt or mortgage loan as planned (Yes)</td>
<td>9.39</td>
</tr>
<tr>
<td>Capacity to afford a meal with meat, chicken or fish every second day (Cannot afford)</td>
<td>36.03</td>
</tr>
<tr>
<td>Capacity to afford to keep home adequately warm (Cannot afford)</td>
<td>22.31</td>
</tr>
</tbody>
</table>

**Source:** 2006 Income and Living Conditions Survey, TURKSTAT.

Upon examining the data obtained in 2016, a decrease is observed in all the indicators. Particularly, the shares of ownership of color television and mobile phones have declined to almost zero, while the percentage of those who cannot afford washing machines has declined to 1.67%. Nonetheless, the issue of financing a one-week holiday away from home is designated as the biggest problem. The rate of those who claim that they cannot afford such a vacation
is 62%. While the proportion of those who do not own automobiles is 41%, there has been an increase in the capacity to finance unexpected expenditures (33%) which is previously reported as the biggest problem. Therefore, a larger portion of the households feels ready for such a possible financing problem. In 2006, 60% of the population stated that they could not consume meals with meat, chicken or fish every two days, but in 2016 there was a dramatic decrease down to 36%. As of 2006, the percentage of people who cannot afford to pay rent, interest-bearing debt or mortgage loans was 9.63%, and then it became 9.4% in 2016.

The rate of material deprivation in EU-28 countries was 16% (75 million people) for the year 2016. Particularly those living in material deprivation in Romania and Bulgaria comprise approximately half of the population. The estimated proportion of those who are exposed to poverty risk or social exclusion for EU-28 countries is 23.5% in 2016. The same ratio is estimated at 41.3% for Turkey. Similarly, 37.3% of those from EU countries state that they could not finance unexpected expenditures as of 2015. In 2014, 16.7% of the population stated that they could not renew their clothing, and 18.9% claimed that they did not have a second pair of shoes (EUROSTAT, 2018). Therefore, when attention is paid not only to the poverty incidence but also to the proportion of those who face poverty risk, the segments on which poverty has impacts can be seen clearly.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>60.4</td>
<td>58.8</td>
<td>57.7</td>
<td>56.7</td>
<td>59.4</td>
<td>57.9</td>
<td>55</td>
<td>43.8</td>
<td>29.4</td>
<td>30.3</td>
<td>32.9</td>
</tr>
</tbody>
</table>

Source: 2006 Income and Living Conditions Survey, TURKSTAT.

Table 3 indicates the rates of people living in severe material deprivation in Turkey for the period 2006-2016. The severe deprivation rate, which is expressed as the proportion of those who cannot finance at least four out of previously mentioned nine material deprivation elements, accounts for 60% of the population in 2006. Thus, it can be said that more than half of the population is exposed to poverty risk. Following 2006, along with the economic development, it is seen that the mentioned ratio has a decreasing trend and it reached at the lowest rate of 29.4% in 2014. As of 2014, an upward trend has started, and it has been around 33% in 2016. In this context, the proportion of the population living below the poverty line was 14.3% in 2016, while of those living in severe deprivation were almost twice as high. However, in 2016, the proportion of those who expressed that housing expenditures caused a heavy financial burden was 17.4%, and the percentage of those who expressed a slight burden was about 60%. Therefore, 77.4% of the population has difficulty in meeting housing expenses. It is 43.75% who claimed that they could not change worn and old furniture for economic
reasons (Capacity to afford to replace worn furniture). In this context, it appears that a large portion of the population has problems in meeting the basic living expenses.

**Conclusion**

Poverty is seen as a global problem with which all economic actors around the world struggles. The objectives set by the UN are among the priority policies of the governments and emphasis is given to applications favoring the poor. Particularly by means of fair income distribution, individuals below the poverty line are given a chance to exceed this limit, and improvements are being made in favor of those who are exposed to poverty risk.

The concept of material deprivation in the study is examined particularly for Turkey. A descriptive method is utilized in the income and living conditions survey conducted by TURK-STAT from which the data is obtained over the period between 2006 and 2016. The nine factors referenced in material deprivation calculations are analyzed within the scope of 2006 and 2016, and the changes that took place over the years are followed. Also, the rate of households exposed to poverty risk is determined by the inclusion of the severe deprivation rate. Accordingly, 60.4% of the population in 2006 and 32.9% in 2016 have experienced severe material deprivation. In this context, it is determined that twice as many of the households living below the poverty line are exposed to poverty risk.
References


MATERIAL DEPRIVATION IN TURKEY
Altuğ M. KÖKTAŞ, İşıl Şirin SELÇUK


Introduction

Housing need is one of the basic needs of individuals in society. The housing need is addressed by housing production. Although primary aim is to satisfy needs of the individuals, the housing sector, in a broader sense construction sector, is the major economic areas of activity of a country. In addition to being a source of income for producers, it is also a means of accumulating wealth for individuals (Dilber & Sertkaya, 2016) besides the need for housing, which in this respect is regarded as an asset that has not only social effects but also economic effects.

As an entity, it is possible to define housing a driving force of economies because of not only a solution to the need for housing, also it is an alternative investment instrument (Trimbath & Montoya, 2002) and it has effects on employment and national income because of its relations with other industries (INTES, 2017). Therefore, global developments and policies applied at the national level affecting the dynamics of the housing market bring about significant effects for the economies. The most important effect of policies implemented on housing sector is about prices. Whatever house prices change due to demand and supply equation (Kaya, 2012), international financial crisis, expectations about the future, policies implemented by governments, credit interest rates, tax incentives and tendencies about spending are the factors that change the supply-demand equilibrium.

When we investigate the literature analyzing the factors affect house prices, it is possible to conclude that the existing studies take monetary policy variables such as inflation rate, GDP, money supply and exchange rate into account. But there is a limited literature investigating the effects of fiscal policies on house prices and asset prices. In these studies, fiscal policies have an important role in determining fluctuations in house prices. In this regard, the housing market can be affected by fiscal implementations such as taxation on house sales income, capital taxes on housing gains, tax rate discounts in house purchasing process, subsidies in first house purchases (Nordvik, 2006; Maclennan et al. 1998). Also, it is implied that unexpected changes in

* Erçiyes University, Faculty of Economics and Administrative Sciences, Department of Public Finance. ahmetaysu@erciyes.edu.tr
fiscal policies (Afonso & Sousa, 2011) and government expenditures shocks (Afonso & Sousa, 2012) are effective on house prices. On the other hand, Tagkalakis (2011) investigates the relationship between financial market movements and fiscal policies and concludes that equity prices both affect government revenues and expenditures but also the most important effect on fiscal balance belongs to house price changes.

Fiscal precautions such as capital taxes on housing gains, exceptions and exemptions related to revenues gained from the housing market, discounted value-added tax in house purchasing, subsidies provided to house buyers for the first time, are effective on house prices via affecting disposable income of households and house demand. Government wage payments and expenditures directed to infrastructure have an indirect effect on house demand. Also, an uncertainty about the long-term sustainability of public finance affects finance conditions of house credits (mortgage) and constrains house prices negatively by increasing long-term interest rate (Gupta et al. 2014: 48).

In this study, we aim to analyze the effects of fiscal policy in the Turkish housing market. In order to do this, we take the regional housing price index into account and government expenditures between years 2000 and 2017. We employ a vector autoregressive method in order to build an endogenous model. The originality of the study is twofold. First of all, the existing studies investigate the housing sector via monetary policies. There are a few papers which investigate the relation between fiscal shocks and housing market. This paper will be one of the initial studies analyzing the relation in emerging market economies, different from the existing literature. In the literature, there is a few papers investigating the housing market in emerging market economies due to lack of data belonging to related economies. Secondly, the regional data belonging to NUTS regions in Turkey provides us with the results for regions. The possible differences between regions would provide us with important policy implication. To our knowledge, there is no study analyzing the relation in sub-region perspective for any economy, nor developed neither emerging market economies.

The rest of paper is organized as follows. In the second section, the existing literature is summarized. In the following section, the situation in the Turkish housing market is presented. In the fourth section, the data and model explained. In the fifth section, empirical investigation results are shown and interpreted.

**Literature Review**

The existing literature investigating the effect of fiscal policies implemented by governments on housing sector mainly focuses on developed economies such as the United States, United Kingdom. One of them belongs to Afonso and Sousa (2011). They analyze the effects of fiscal shocks on asset prices in United States, United Kingdom, Germany and Italy, by separating
fiscal policy shocks via fully simultaneous system approach. According to analysis results, while public expenditure shocks have positive and persistent effects on housing prices, public revenue shocks have a positive but weak effect on it. In the United Kingdom, after fourth-quarter house prices increase persistently because of a public expenditure shock, also house prices increases persistently after a public revenue shock. In Germany, housing prices respond to a positive public expenditure shock, but it decreases rapidly after the fourth quarter. Similarly, the response of house prices to a public revenue shock is positive and significant. In Italy, the response of housing prices to a shock in public expenditures is positive, while it is negative in case of public revenue shock. Afonso and Sousa (2012) investigate the macroeconomic aspects of fiscal policies via BSVAR approach. They obtained similar results with Afonso and Sousa (2011).

Agnello and Sousa (2011) imply that positive fiscal shocks have a negative impact on housing prices in ten industrialized economies by employing PVAR (Panel vector autoregression) analysis method. According to results, it is possible to conclude that if public induces budget deficits, it would cause higher real interest rate and it would crowd out private sector consumption and investment expenditures. In the end, asset prices would decrease.

In the study of Agnello and Sousa (2013), ten industrialized economies are investigated by PVAR analysis method in order to find the impact of budget deficits on housing prices. The results indicate that a positive budget deficit shock induces a reduction in house price. Another finding is that in smaller economies, size and persistence of response is bigger and longer than others and that in economies where governments have more power, the deterministic role of fiscal policies on housing prices is bigger than others.

Ruiz and Vargas-Silva (2016) investigate the United States economy in order to find fiscal shocks effect on housing prices via VAR analysis method. According to analysis results, the response of house prices to a shock in public revenues is positive but short term, while the response of prices to a shock in public expenditures is negative and permanent.

Gupta et al. (2014) analyze the South African economy to test the relation between fiscal policies and asset prices in 1966-2012 period via TVP – VAR (time-varying parameter vector autoregressive) model. According to analysis results, fiscal policy shocks have a time-varying and little impact on asset prices. Between 1970 and 1990s, fiscal expanding has a relation with decreasing housing prices, in the first decade of the 21th century, expanding fiscal policy is related with increasing housing prices.

Aye et al. (2014) examined the impact of fiscal policy shocks on asset prices in South Africa using the 1966-2011 data (quarterly data) with the B-VAR (Bayesian Vector Autoregressive) model. According to the analytical results, unexpected positive public-revenue shocks have a persistent effect on housing prices, and expected positive public-sector shocks have no significant effect on housing prices. Both expected and unexpected changes in public spending do not have an
effect on housing prices. The study also analyzed three different fiscal policy scenarios. A spending shock leading to a budget deficit does not have an impact on housing prices, a deficit financed tax-cut has a positive and persistent effect on housing prices, and a balanced budget spending shock has had a detrimental effect on housing prices, but it would be temporary.

Balcılar and Tören (2015) investigate the impact of fiscal policy on asset and housing prices of the Turkish economy for the period of 1988-2014 by using B-VAR model. According to the results of the analysis, a positive shock in public revenues affects housing prices positively, while a positive shock in public expenditures did not have a significant effect on housing prices.

**Housing Market in Turkey**

The construction sector is seen as a driving force for many countries’ economies due to the added value and the potential for job creation (Ergül, 2007). However, it is also in a position to create demand for goods and services produced by more than 200 sub-sectors linked to this sector. From this point of view, the industry can easily be expressed as a locomotive for the country’s economies.

From this point of view, the industry can easily be expressed as a locomotive for the economies. Government policies, international credit institutions, investment decision-making institutions play a key role in the development of the sector with such an important function (İN-TEŞ, 2017). The construction sector, which plays a key role in the country’s economy, is at the forefront of sectors that are heavily influenced by the cyclical movements of the economy. Although the level of sensitivity of the sector to the economy varies in each country, the presence of a general effect is evident (Dalkılıç & Aşkııın, 2016).

When the construction sector in Turkey has observed that 80 percent of the sector belongs to the housing sector. At this point, the housing sector has an important share in the Turkish construction sector. In the last decade, there has been a significant improvement in the sector. In this process, housing sales have increased and there has also been noticeable price increases in housing prices. Increasing the number of new housing projects and facilitating the provision of credits have played an important role in the development of the sector in question. Moreover, the increase in population and the improvement in income level have increased the level of individual housing need, as well as the housing needs for investment needs and the added value created by the sector, has increased steadily (Ertem & Yılmaz, 2014).

The potential of the construction sector and its contribution to Turkey’s economy as the effects on GDP and employment level can be assessed in two different ways. At this point, the contribution to GDP of the construction sector in Turkey is presented in table 1.
When we examine the share of the construction sector in GDP in the Turkish economy, it is possible to conclude that the sector has started to increasing trend after 2001. The share of the construction sector in GDP, which was around 6% between 2001 and 2005, declined to 5.2% in 2009 due to the global economic crisis. However, it can be said that the share of the construction sector in the national income, which has entered a recovery period since 2009, it has increased steadily until 2017. In addition to the GDP contributed by the construction sector, another important effect is seen in total employment. The share of the employed in the construction sector in total employment is presented in table 2.

Table 1: Share of Construction Sector in GDP (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Employment</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>20,615</td>
<td>1,305</td>
</tr>
<tr>
<td>2002</td>
<td>20,923</td>
<td>1,366</td>
</tr>
<tr>
<td>2003</td>
<td>21,234</td>
<td>1,427</td>
</tr>
<tr>
<td>2004</td>
<td>21,545</td>
<td>1,489</td>
</tr>
<tr>
<td>2005</td>
<td>21,858</td>
<td>1,551</td>
</tr>
<tr>
<td>2006</td>
<td>22,170</td>
<td>1,613</td>
</tr>
<tr>
<td>2007</td>
<td>22,484</td>
<td>1,675</td>
</tr>
<tr>
<td>2008</td>
<td>22,798</td>
<td>1,737</td>
</tr>
<tr>
<td>2009</td>
<td>23,112</td>
<td>1,799</td>
</tr>
<tr>
<td>2010</td>
<td>23,426</td>
<td>1,861</td>
</tr>
<tr>
<td>2011</td>
<td>23,740</td>
<td>1,923</td>
</tr>
<tr>
<td>2012</td>
<td>24,054</td>
<td>1,985</td>
</tr>
<tr>
<td>2013</td>
<td>24,368</td>
<td>2,047</td>
</tr>
<tr>
<td>2014</td>
<td>24,682</td>
<td>2,109</td>
</tr>
<tr>
<td>2015</td>
<td>25,006</td>
<td>2,171</td>
</tr>
<tr>
<td>2016</td>
<td>25,329</td>
<td>2,233</td>
</tr>
<tr>
<td>2017</td>
<td>25,653</td>
<td>2,295</td>
</tr>
</tbody>
</table>

The construction sector and employment are closely related. As a result of the growth in the construction sector, the number of people employed in the sector and their share in total employment are increasing. In the Turkish economy, it is estimated that a 1% growth in the construction sector increases employment nearly 13 thousand people (Dalkılıç & Aşkın, 2017). However, it can also be said that the construction sector has increased the level of employment by creating a multiplier effect. According to the findings of the analysis made by Günlük-Şenesen et al. (2013), when the construction sector private final demand of in Turkey increase a billion Turkish Lira (the constant year 2002), it provides employment opportunity close to 48,000 people. More than 60% of the total employment is in the construction sector. This result provides important data showing the importance of the construction industry in the economy. From the perspective of Turkey also it is possible to say that the number of employment in the sector was around 1.3 million people in 2009, the number of employed in the construction sector has risen to over 2 million in 2017. In this respect, it can be said that the construction sector is an important source of employment contribution in terms of the Turkish economy.

Investments made in the construction sector are classified as the fixed capital goods. At this point; the activities expressed as fixed capital investment that will increase the economic growth rate, contribute positively to the GDP and increase employment and reduce unemployment, play a key role for the country's economy. For this reason, the construction sector is a dynamic element that activates many other sectors, especially the industry, and therefore it is important to increase the investments to be made for the sector, in terms of both growth and development. Given the effects of construction sector on GDP and employment, it can be said that it is a sector that needs to be closely monitored and closely monitored for the country’s economy (Dalkılıç & Aşkın, 2017).

A large part of the construction sector in Turkey is based on a housing production. The number of houses and housing prices are also important factors affecting the performance of housing for the investment property as well as for the need (accommodation). The percentage change in housing prices, housing prices and housing sales in Turkey are presented in tables 3 and 4, respectively.
Table 3: Housing Production and Housing Sales in Turkey

<table>
<thead>
<tr>
<th>Years</th>
<th>Building License</th>
<th>Building Permission Certificate</th>
<th>Housing Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>161920</td>
<td>161491</td>
<td>--</td>
</tr>
<tr>
<td>2003</td>
<td>202854</td>
<td>162908</td>
<td>--</td>
</tr>
<tr>
<td>2004</td>
<td>330446</td>
<td>164994</td>
<td>--</td>
</tr>
<tr>
<td>2005</td>
<td>546618</td>
<td>249816</td>
<td>--</td>
</tr>
<tr>
<td>2006</td>
<td>600387</td>
<td>295389</td>
<td>--</td>
</tr>
<tr>
<td>2007</td>
<td>584955</td>
<td>326484</td>
<td>--</td>
</tr>
<tr>
<td>2008</td>
<td>503565</td>
<td>357286</td>
<td>427105</td>
</tr>
<tr>
<td>2009</td>
<td>518475</td>
<td>469981</td>
<td>555184</td>
</tr>
<tr>
<td>2010</td>
<td>907451</td>
<td>429755</td>
<td>607098</td>
</tr>
<tr>
<td>2011</td>
<td>650127</td>
<td>556769</td>
<td>708275</td>
</tr>
<tr>
<td>2012</td>
<td>771878</td>
<td>556331</td>
<td>701621</td>
</tr>
<tr>
<td>2013</td>
<td>839630</td>
<td>726339</td>
<td>1157190</td>
</tr>
<tr>
<td>2014</td>
<td>1031754</td>
<td>777596</td>
<td>1165381</td>
</tr>
<tr>
<td>2015</td>
<td>892791</td>
<td>732786</td>
<td>1289320</td>
</tr>
<tr>
<td>2016</td>
<td>992008</td>
<td>752578</td>
<td>1341453</td>
</tr>
<tr>
<td>2017</td>
<td>228918</td>
<td>194036</td>
<td>128923</td>
</tr>
</tbody>
</table>

Source: TSI, 2018. (Note: Quarter values for the first quarter of 2017)

The number of building license follows a volatile pathway in Turkey. Especially effects of the global crisis in 2008, have continued until 2010. After 2010, the effects of the crisis gradually disappeared, also the fiscal stimulus measures, such as the tax cuts that the government imposed to support the real sector, have also positively affected the construction sector. The number of building licenses, which was 518475 in 2009, increased to 907451 in 2010. Although housing sales did not increase much in the same period, sales of 1157190 units in 2013 made the building closer to the number of building permits. When we examine data closer, it is seen that another noteworthy year is 2014. In the same year, the number of building permits increased by 30% compared to the previous year. In this period, it is seen that the sales of housing are at the level of 1.1 million. However, in 2015, the number of building use and licenses decreased compared to the previous year. This situation can be interpreted as the desire to dissolve the inventories of the producers in spite of the good housing sales in 2015, as well as the failure to start new projects in order to protect their financial levels and to restrict supply against possible geopolitical risks (Dalkılıç & Aşkıın, 2016, p.75).
Table 4: Housing prices in Turkey and Change (%)

<table>
<thead>
<tr>
<th>Period</th>
<th>Housing price index</th>
<th>Change compare to previous month (%)</th>
<th>Change compare to previous year (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 2015</td>
<td>201.28</td>
<td>0.85</td>
<td>18.41</td>
</tr>
<tr>
<td>Jan. 2016</td>
<td>202.32</td>
<td>0.52</td>
<td>17.5</td>
</tr>
<tr>
<td>Feb. 16</td>
<td>203.95</td>
<td>0.81</td>
<td>16.44</td>
</tr>
<tr>
<td>Mar. 16</td>
<td>206.22</td>
<td>1.11</td>
<td>15.35</td>
</tr>
<tr>
<td>Apr. 16</td>
<td>208.52</td>
<td>1.12</td>
<td>14.7</td>
</tr>
<tr>
<td>May. 16</td>
<td>211.93</td>
<td>1.64</td>
<td>14.57</td>
</tr>
<tr>
<td>June. 16</td>
<td>213.89</td>
<td>0.92</td>
<td>13.87</td>
</tr>
<tr>
<td>July. 16</td>
<td>217.41</td>
<td>1.65</td>
<td>13.98</td>
</tr>
<tr>
<td>Aug. 16</td>
<td>219.7</td>
<td>1.05</td>
<td>14.18</td>
</tr>
<tr>
<td>Sep. 16</td>
<td>221.38</td>
<td>0.76</td>
<td>13.9</td>
</tr>
<tr>
<td>Oct. 16</td>
<td>222.45</td>
<td>0.48</td>
<td>12.86</td>
</tr>
<tr>
<td>Nov. 16</td>
<td>224.05</td>
<td>0.72</td>
<td>12.26</td>
</tr>
<tr>
<td>Dec. 16</td>
<td>225.87</td>
<td>0.81</td>
<td>12.22</td>
</tr>
<tr>
<td>Jan. 17</td>
<td>228.92</td>
<td>3.27</td>
<td>13.32</td>
</tr>
<tr>
<td>Feb. 17</td>
<td>230.26</td>
<td>0.59</td>
<td>13.57</td>
</tr>
<tr>
<td>Mar. 17</td>
<td>231.92</td>
<td>0.72</td>
<td>13.57</td>
</tr>
<tr>
<td>Apr. 17</td>
<td>234.29</td>
<td>1.02</td>
<td>13.51</td>
</tr>
<tr>
<td>May. 17</td>
<td>236.86</td>
<td>1.1</td>
<td>13.01</td>
</tr>
</tbody>
</table>


When we look at table 4, it is noteworthy that house prices showed a steady upward trend from December 2011 until May 2017. In December 2015, Turkey has reached the 201.28 level housing price index increased by 0.85% compared to the previous month. When the same period is evaluated compared to the previous year, an increase of 18.41% can be said. Turkey house price index increased in this period, which corresponds to 8.82% in real terms. Another remarkable period about housing price index in Turkey is in January 2017. In this period, the housing price index increased by 3.27% compared to the previous month and the index rose to 228.92 levels. In the same period, the percentage change compared to the previous year was 13.32.

In figure 1, the annual change in house price index in December 2016 for each region is presented. The highest change in the percentage change in housing prices is in TR22 (Balskesir and Çanakkale) with 26.89%, TR21 (Edirne, Kırklareli and Tekirdağ) with 21.48% and TR31 (İzmir) with 17.56%. The lowest change in housing price compare to previous period belongs to TRC1 (Kilis, Adiyaman and Gaziantep) with -0.28%, TRA1 (Erzurum, Erzincan and Bayburt)
with 2.62% and TRC2 (Diyarbakir and Şanlıurfa) with 2.80% (CBRT, 2017). Regionally, it can be said that the greatest increase in the annual basis is concentrated in the Trakya region and the Aegean and Mediterranean coastal area. This can be explained by the increased demand of foreigners for housing. In the Southeast region where house prices are the lowest, the refugees run away from civil war in Syria want to move on the west of Turkey. So it may be a reason to fall in price in the region in question (Sezgin & Aşarkaya, 2017, p.22).

There is a number of factors are taken into consideration when explaining the change in housing prices. Factors such as housing production levels, total housing demand, government policies and access to financial resources are examples. Recently, consumer preferences (neighbourhood, m2, facade etc.) and quality of building materials (Hülagü et al., 2016), as well as the innovation process, can be mentioned as other prominent factors. However, in recent years, it has also been observed that the prices of second-hand housing have continuously increased. The reason for the increase can be explained by the effects of the legal regulations imposed on the demand and price. It is stated that the regulation of VAT change, which was enacted in 2013, by the Law on the Transformation of Areas Under Disaster Relief, which is known as the Urban Transformation Law No. 6306, which was put into effect in 2012 (Cushman & Wakefield, 2016, p.3).

**Data and Model**

In order to analyze the effects of fiscal shocks on house prices in Turkey, it is possible to use sub-regions of Turkey made according to the NUTS system. In this regard, Turkey has 26 sub-regions according to the Turkish Statistical Institute. The Central Bank of Turkish Republic publishes the hedonic house price index monthly basis for each sub – region. In this regard,
monthly data will be useful for the empirical analysis. The data range covers January 2010-February 2017 period.

In order to demonstrate the behavior of the government implementing fiscal policies, we employ government expenditures variable as done by Afonso and Sousa (2011) and Agnello and Sousa (2013). Moreover, we employ some additional variables as control variables. First of all, we put into the model industrial production index to symbolize gross domestic product change. Because the GDP data is published quarterly. On the other hand, we employ the consumer price index in order to take price change into account as done by Agnello and Sousa (2011). In the light of the existing literature, we can write the model as follows:

\[ y_{it} = \tau_0 + \tau (L) y_{it} + f_t + \varepsilon_{it} \]

where we connote first-order VAR model above. Because we employ auto-regression methodology to explore the linkages between fiscal policies and housing prices in the Turkish economy as many studies in the literature, (Agnello & Sousa, 2011, Gupta et al. 2014). In the equation, \( Y_t \) denotes the vector of endogenous variables, \( \tau_0 \) denotes the vector of constants. \( \tau L \) is a matrix polynomial in the lag operator and \( \varepsilon_t \) is a vector of error terms. The vector of endogenous variables includes the housing price index (hereafter, HPI), government expenditures (hereafter, GOV), industrial production index (hereafter, GDP) and consumer price index (hereafter, CPI). In practice, it can be expressed as \( Y_n = (HPI_n, GOV_n, GDP_n, CPI_n) \).

In our analysis, we build the model explained above again for each 26 sub-regions respectively. In what concerns the impulse-response functions, we transform the system in a “recursive” VAR and impose a triangular identification structure (Hamilton, 1994). We follow the standard Cholesky decomposition of the variance-covariance matrix of residuals. The order of variables in the impulse-response analysis, we follow Agnello and Sousa (2011). That means housing price index is placed first, then the GDP, price level and lastly government expenditures place into the endogenous model. The sources of data belonging to series are shown in table 5.

**Table 5: Explanation of Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Acronym</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Expenditures</td>
<td>GOV</td>
<td>International Financial Statistics (IMF)</td>
</tr>
<tr>
<td>Gross Domestic Product Change (%)</td>
<td>GDP</td>
<td>International Financial Statistics (IMF)</td>
</tr>
<tr>
<td>(Industrial Production Index)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing Price Index</td>
<td>HPI</td>
<td>Central Bank of Republic of Turkey (CBRT)</td>
</tr>
<tr>
<td>Consumer Price Index</td>
<td>CPI</td>
<td>International Financial Statistics (IMF)</td>
</tr>
</tbody>
</table>
Empirical Results

We estimate VAR model for each period and include control variables into all models. Before estimating them, we have to control if there is a unit root in the series included into the model. With this aim, we employ unit root tests initially. Augmented Dickey – Fuller (hereafter, ADF) unit root test and Phillips-Perron (hereafter, PP) unit root test are implemented in order to identify stationary of series. According to test results, series have unit root in level generally. GDP, CPI and GOV series have unit root in level and most of the HPI series have unit root, too. When we derive the series, it is clear that all unit roots disappear. So, there is no unit root in first difference of series and we accept that all series are stationary in first difference. Moreover, series might have a long memory and for this reason we include the series into the model with their first difference. In order to save place, we do not report all results in a table.

In the second step, we determine the lag number for each sub-region. The number of lag is determined according to the Schwarz information criterion. After this step, we report the impulse-response analysis results in figure 2.

In the figure, the response of each housing price index belongs to sub-regions to a 1% positive shock in government expenditures is presented. According to results, the response of housing price index to a 1% positive shock in government expenditures in TR10, TR41, TR51, TR52, TR62, TRC2 and TRC is positive and statistically significant for various time periods. The significance of results is valid for two periods in the related sub-regions, except TR41. It is significant statistically for eight periods. Also, the power of response varies among sub-regions. In TRC2 and TR41 sub-regions, it is considerably strong. On the other hand, in the rest of sub-regions (TR10, TR51, TR52, TR62 and TRC3), it is so weak and turns to negative very fast.

The response of housing price index to a positive government expenditure shock in TR21, TR22, TR42, TR31, TR71, TR61, TR90, TR63 and TRC1 is positive, but the results are statistically insignificant. This means, although the results are positive and expected theoretically, it is insignificant statistically.

On the other hand, there are a few sub-regions which have a negative response to a shock in government expenditures. In TR33, TR32 and TRA2 sub-regions, the response of housing price index to a shock in government expenditures is negative and statistically significant for a short time period. Also the response is weak in all sub-regions.

In TR81, TR82, TR83, TR72, TRB1, TRA1 and TRB2 sub-regions, the response of housing price index to a shock in government expenditure is also negative. But the statistical significance is not valid in this sub-region. For this reason, it is not possible to interpret the results for these sub-periods is not possible.
Figure 2: Response of Housing Price Index to a 1% Positive Shock in Government Expenditures

Response of HPI in TR21

Response of HPI in TR10

Response of HPI in TR22

Response of HPI in TR41

Response of HPI in TR42

Response of HPI in TR81

Response of HPI in TR31

Response of HPI in TR33

Response of HPI in TR51

Response of HPI in TR82

Response of HPI in TR83

Response of HPI in TR71
Response of HPI in TR52
Response of HPI in TR61
Response of HPI in TR32
Response of HPI in TR62
Response of HPI in TR72
Response of HPI in TR90
Response of HPI in TR63
Response of HPI in TRB1
Response of HPI in TRA1
Response of HPI in TRA2
Response of HPI in TRB2
Response of HPI in TRC3
Response of HPI in TRC2
Response of HPI in TRC1
Conclusions

In this study, we aim to analyze the effects of government expenditures on housing prices in the sub-regions of the Turkish economy. In the related literature, the effects of monetary policy implementations on housing prices are well investigated and there is a huge literature analyzing the effects of monetary policies on housing prices. In this regard, this paper would provide important information about the relation between fiscal policies and housing sector prices.

In order to investigate the relation in the Turkish economy, we employ sub-regional data different from existing literature. In order to do that, we use the region system provided by the Turkish Statistical Institute. The conventional vector autoregressive model is employed to make the empirical analysis. In the VAR analysis, we analyze the response of housing prices to fiscal policy implementations in each sub-regions. According to results, in seven of twenty six sub-regions, TR10, TR41, TR51, TR52, TR62, TRC3 and TRC2, housing prices would increase after the policy implementation. The responses are considerably weak and valid in a short-term period. The results implying a positive interaction between fiscal policy and housing prices are consistent with Afonso and Sousa (2011) and Afonso and Sousa (2012). But different from Afonso and Sousa (2011), the effect is not persistent.

The empirical results also report negative relation in some sub-regions in the Turkish economy. Only three of twenty six sub-regions, TR32, TR33 and TRA2, housing prices would decrease after the policy implementation. The responses are weak and valid in a short-term period. This result is also consistent with the study of Agnello and Sousa (2011).

According to results, it is clear that fiscal policies have different effects. The source of the difference may stem from the type of government expenditure made and the region where the government expenditure made. It is possible to conclude that the sub-regions where affected positively from the fiscal policy implementations are highly industrialized and/or agricultural production areas. In this regard, an expenditure in order to improve the infrastructure of industrial zone and/or an investment in order to increase irrigation area would increase production and it would increase house demand. This might consistent with Gupta’s et al. (2014) indirect effect approach.
References


FISCAL POLICY SHOCKS AND HOUSE PRICES RELATION IN TURKEY: A REGIONAL PERSPECTIVE
Ahmet AYSU


Introduction

In the state of emergency, the realization and financing of public services is theoretically the leading function of both the traditional state and the social welfare state. There are some tasks that the public sector needs to do before or after natural disasters, which have an important place in extraordinary situations. One of these tasks is the tax policy for natural disasters.

Natural disasters lead to loss of life and assets and have large impacts on people, businesses and governments. Governments at different scales are decisive to assessing, reducing and financing disaster risk. From an economic perspective, governments are exposed to natural disaster risk and potential losses due to three functions: (i) the allocation of goods and services (security, education, clean environment), (ii) the provision of support to private households and business in the case of market failure, (iii) and the distribution of income (Mechler, 2004; see Musgrave, 1959).

From a budgeting perspective, sovereign disaster risk arises as a contingent public sector liability, which is associated with government’s functions to provide relief, support to recovery, undertake reconstruction and raise tax revenue. Once a disaster hits, these contingent liabilities can lead to large costs accruing to governments for providing relief, recovery and reconstruction assistance (Mechler et al., 2016, 5).

The tax policy for natural disasters may be related to a concrete natural catastrophe, as well as mitigating the effects of possible natural disasters. The first form of a tax policy for a concrete natural disaster is the introduction of additional taxes that affect all over the country in order to meet the financing needs. The second form is the tax policy of reducing tax obligations for taxpayers who suffered from natural disasters.

The subject of this study is to examine the tax policy for the financing of natural disasters. This framework will focus primarily on the financial impact of natural disasters. in the aftermath, description will be made regarding tax policy.

* Research Assistant at Niğde Ömer Halisdemir University, PhD Candidate at Hacettepe University, Department of Public Finance, eatsan@hacettepe.edu.tr.
Natural Disasters From The Financial Theory Perspective

The main field of activity of the finance theory is the analysis of financial events. Financial events are shaped on the basis of public expenditures and public incomes. As a result of the extraordinary situations in which public spending and public revenues both increase in quantity, they vary in composition. In finance literature, the impact of extraordinary events such as war and social disturbances on public goods is explained by Displacement Theory. In 1961, A.T. Peacock and J. Wiseman, "The Expansion of Public Expenditures in the United Kingdom" (Henrekson, 1993, 54). According to these two sources, the increase in public spending is due to extraordinary reasons such as war. Although natural disasters are not explicitly mentioned here, natural disasters are a state of emergency. From this point, the tax policy to be applied in extraordinary circumstances can be linked to the displacement theory.

According to the displacement theory, in order to finance the increased public expenditure in extraordinary circumstances, the state also increases taxes. Increased taxes are also accepted by voters because of their approach to extraordinary circumstances (Savaşan, 2015, 46). Therefore, governments resort to additional taxes as a primary source of solutions to financial problems arising from the earthquake and other natural disasters. Initially, these tax incomes, which were set aside to provide the financing needed to eliminate the damage caused by natural catastrophes, continue to be implemented after the end of the extraordinary period. As a matter of fact, the voters are getting used to these taxes, and the taxes do not go to the previous level (Savaşan, 2015, 47). In fact, for the financing of natural catastrophes, the taxpayers of the political authorities taking advantage of the psychological situation of the taxpayers in extraordinary circumstances, lead to an increase of the tax burden of the society in an unresponsive manner.

Fiscal Effects of Natural Disasters

Implications for Fiscal Policy

While monetary policy is conducted under the discretion of an independent central bank, fiscal policy must balance public sentiments, the opposition and the debtors in deciding both how to fund a fiscal response and how to distribute the money to victims.

Natural disasters affect both government expenditure and taxation revenue in the immediate to medium term. On the expenditure side, the government has three options in funding a fiscal response. It can redirect funding from planned projects and cut existing spending, borrow, or raise taxes. For maximum effectiveness, the chosen option should be consistent with the prevailing economic conditions. If fears about high inflation and an overheating economy dominate, a tax levy on citizens would be the most effective as it redirects funds to the needed areas while simultaneously reducing private demand.
If the economy was already weak, borrowing is more effective as it has the additional effect of boosting aggregate demand on top of redirecting resources. However, a government’s ability to borrow is limited by the existing external debt as additional debts can raise the risk premium on government debts and the additional costs may outweigh the benefits (White, 1997, 336). The danger of excess debt is especially great when the effects of reduced tax receipts are added to the additional expenditure.

Using the funds raised, the government can compensate victims through cash payments, contribute to public infrastructure projects or subsidize affected industries. While compensation for victims is popular with both the media and the public, it can create a moral hazard problem as the expectation of compensation becomes a disincentive for private preparedness against future disasters (Becker and Posner). Instead, the government should use fiscal policy to steer resources towards the prevention and mitigation of disasters. Furthermore, the private sector will not adequately supply goods with positive externalities as the private costs may outweigh the social benefits. Therefore, the government as the provider of public goods should also redirect spending towards cleanup efforts and reconstruction of public infrastructure following a disaster (Ma, 2011, 6).

According to Noy and Nualsi (2008) fiscal behavior in the aftermath of disasters to be different between developed and developing countries. In developed countries, governments seem to be ‘leaning against the wind’ and increasing spending and cutting taxes following a large disaster event. On the other hand, fiscal policy in developing countries can best be described as procyclical; with governments largely decreasing spending and increasing revenues in the aftermath of large natural disaster events.

The Impact of Natural Disasters on the Budget Constraint

Natural disasters cause social, economic and financial effects at different levels according to size and type. Financial impacts are the impacts of the state on budgetary constraints. A budget constraint is a concept related to the maximum amount of service that can be offered to the state by a certain amount of resources. The budget constraint restricts the area of action on which the government is likely to implement policies. Because every new public need that arises requires new resources. Creating new public resources is not easy. Experienced natural disasters, leads to a change in the position of resource allocation from the budget. Natural disasters reveal extraordinary and immediate needs such as nutrition, housing, health, employment, reconstruction of physical spaces that have been destroyed. In the time of great destruction, the resources allocated for priority infrastructure investments are being transferred to the solution of sudden problems arising from natural disasters (Cummins and Mahul, 2009, 1).
In times of natural disasters such as major earthquakes, the available budget resources are not sufficient. At such times, parliament is seeking new resources by making additional budget. For example, the financial resources required by the earthquake in the Marmara region in 1999, was funded by making additional budget.

The Impact of Natural Disasters on Tax Capacity

Tax capacity is the sum of the potential resources the government can tax. According to modern taxation understanding, the increase in income, wealth and consumption will increase the tax capacity. In the opposite case, the decrease in tax capacity is inevitable. Living catastrophes reduce tax capacity by leading to a loss of production factor and accumulated wealth while decreasing consumption by reducing disposable income from the other side.

The most important financial problem in areas where natural disaster is experienced is the loss of tax resources. This loss is mainly loss of work power caused by loss of life and therefrom loss of income tax base. Secondly, loss of income and corporation tax is a problem because the destruction of businesses in places where disaster is experienced reduces the profits from commercial and occupational activities. Most important is the loss of consumption taxes such as VAT and SCT, which is the result of diminishing activity in commercial life especially in regions where big disasters are experienced.

On the other hand, the risk of natural disasters, especially in places with first degree earthquake regions, reduces the investments made in these areas. Reduced investments lead to a decrease in tax capacity. Migration from these regions towards other regions reduces the number of taxpayers in natural disaster areas due to the shift in the work force.

The Impact of Natural Disasters on the Insurance System

In the compensation of losses caused by natural disasters, it is compulsory to take advantage of the insurance sector if the state cannot be financially sufficient. As a matter of fact, the World Bank has adopted a market-based system at the point of reducing financial risks arising from natural disasters and supports this as a public-private partnership-like structure (Cummins ve Mahul, 2009, 3). The "Compulsory Earthquake Insurance Fund" established in 2000 is an improved funding system based on World Bank support. This model is based on market mechanism. Persons and institutions insure their property, such as housing, vehicles, workplace, etc., against earthquake and other natural disasters for a certain price. These losses are compensated by the insurance companies when losses are caused by natural disasters.

In the case of large-scale natural disasters, the financial burden of disasters rises significantly on insurance companies (Cleary and Boutchee, 2002, 28). In this case, the tax policy applied to insurers and insurance holders is important in reducing the financial risks of natural disasters.
Tax policies for the sector should be designed to mitigate the impact of the insurance sector from natural disasters. For example, it may be appropriate for insurance companies to enforce a tax-deferral action that is consistent with the risk they are charging against the funds they collect (Ünsal, 2016, 5).

On the other hand, the high level of the corporate tax paid by the insurance companies causes indirectly the increase of the earthquake insurance premiums (Harrington, Greg Niehaus, 2000, 1). The increase in insurance premiums will reduce the tendency to insure against natural disasters.

**Tax Policies Applied After Natural Disaster**

The tax policy implemented after experiencing natural disasters can be analyzed in two categories.

- **Additional taxes for natural disaster financing**
- **Policies mitigating taxpayers’ tax burden and duties**

**Additional Taxes for Natural Disaster Financing**

The elimination of constructional, economic and social damage caused by natural disasters causes large financial need. The need for financing costs is not sufficient, although it meets certain degree with donations and public debts. In this case, it is obligatory to either increase existing taxes or to apply tax-similar financial obligations.

In natural disasters, the easiest source of revenue that the state can provide by using sovereign power is taxes. Because the increase in social sensitivity in extraordinary times causes voters to be more tolerant towards political power. Voters do not give serious reactions depending on the tax burdens.

Extraordinary taxes can conflict with the principles of taxation, certainty, appropriateness and ability to pay principles. Indeed, when the financing of the earthquake occurred in 1999, collected additional taxes sparked a debate over contradiction of generality, equality, justice and certainty principles (Yüce, 1999, 1). For this reason, it is usually applied in a limited period. However, it is also a fact that certain taxes, which are set in extraordinary cases such as earthquakes, transformed into continuous taxes.

**Policies Mitigating Taxpayers' Tax Burden and Duties**

Taxpayers in regions where natural disaster is experienced are affected at various levels of natural disaster. In order to mitigate these effects, taxpayers are provided with some advantages in order to alleviate the tax burden.
Measures to reduce the tax burden of taxpayers; abandoning the collection of some of the accrued taxes may be in the form of returning some taxes received during that year. Similarly, in order to indirectly mitigate the tax burden, firms can directly expedite the damage of natural catastrophes, reduce the VAT’s and temporary accelerated depreciation can be applied (Ünsal, 2016, 7).

As measures to facilitate taxpayers’ duties; postponement (deferment) and force majeure can be applied for tax payments. In the first of these two applications, financial relief is provided for taxpayers who have suffered natural disaster, while the burden on the taxpayers is reduced in the second.

**Conclusion**

A large part of disaster risk ends up with the fiscal position, and there has been increasing recognition of the need to deliberately plan for disaster. Yet, fiscal risk management is not an easy proposition, as disaster risk is a contingent liability, i.e. costs accrue only in case of an event. Furthermore, a large part of liabilities is of implicit, unwritten nature (disaster relief and recovery assistance to affected households and business) as compared to direct liabilities (reconstruction of lost infrastructure and assets).

The phenomenon of extraordinary events such as war and social disturbances in the science of finance is explained by the leaping of the impact on the public good. As natural disasters are also an emergency situation, it is a fact known that in these cases the tax rates have been increased to finance increased public expenditures.

Natural disasters have financial implications on many different issues, including budget constraints, tax capacity, taxpayers’ ability to pay taxes, and the insurance system. These effects require the development of tax policies specific to natural disasters.

One dimension of these policies is related to the reduction of the tax liabilities of taxpayers suffering from natural disaster, while one dimension concerns the introduction of new taxes. In addition, various regulations are made in tax legislation in order to combat natural disasters regardless of natural disasters.

However, it should be noted that financial preparations should be made in such extraordinary events as well as in the fiscal policies generally applied after natural disasters. However, the issue should be dealt with from a wider point of view and the tax policy should be designed with the aim of creating a moral preparedness.
References


PART III.
CHAP 5.
FROM LANDLORDSHIP TO PROPERTY

Hulya DERYA* 

Introduction

When the great philosophers in the XVII and XVIII centuries who leave his mark in European thought should be mentioned, one of the first person who spring to mind is John Locke. Locke opposed absolutism strongly and defended separation of powers heatedly. In Locke’s thought, natural law, social contract, state and private property are the judicial basal institutes of modern society. Acting rationally towards this institutions is one of the main duty of socio-philosophical thought since the beginning of social life. Locke displays a moderate political approach throughout his life and he favors the constitutional government. All these characteristics of Locke made him the father of classical liberalism. John Locke, who lived in the second half of 17th century and wrote his philosophical and political works in the later 17th century, is counted as one of the Enlightenment Age thinkers.

The main purpose of our article; is to try to analyze some of the key concepts that constitute the core ideas of John Locke, one of the most important British thinkers of the seventeenth century and one of the most important names in the history of political thought, and evaluations about his works.

God as a Provenance of Natural Law

John Locke (1632- 1704) is the thinker who is known as the father of classical liberalism. Locke is a moderate representative of social contract which protects norms. Locke accepts a elementary natural law which is not only originate in social contract but also above it. In order to understand Locke’s approach, traditional natural law should be comprehended. The theories of natural law usually submit the formula of incontestable right and principles about how people should be treated. According to this approach, individual exits even before society theoretically and hence, the rights of individuals take precedence of society (Rotermundt,1976:52,67). The traditional human of natural law is evaluated as having normative-practic principles before society and integrated into determined cosmic, divine order. In this world view, existence always is a part of human being. The natural law, which Locke attributed to God, provide same rights for every individual and force every individual to accept the liberal rights of the others.

* Kilis 7 Aralik University, hulyaderya11@gmail.com
At this point, although modern and enlightened natural law has a thought of normative individualism and the equality of all humans, it is seen that it has a Judeo-Christian root before the law. In the end, this thought is based on the ideas of imago dei and all individuals are the same in front of God. This nonassignable nature and human rights contain the rights of life, liberty and estate firstly. In case of Locke, he agglomerate these rights into property right. Property is an upper concept of life, liberty and estate. At this point, the transition of natural law in early modern age is seen very clearly. Natural law in Locke does not contain a divine order, law which individuals have to follow, in fact, it’s the opposite. Natural law provide humans with so much rights that every secular order has to accept it (Euchner, 1979:202).

Locke’s doctrine is confined with contradiction in the theories of natural law in early modern age because in these theories, the harmony of world, which is created by God, is tried to refute with the human portray. This was originated in the destruction of the structure of feudal society. These theories were differentiated the terms among the purpose of state (protection of property instead of virtue ethics), the formation of state sovereignty (egoistic maximum benefit versus natural law), the envision of natural law enlightenment (empirical based demo versus the realization of intuitional innate knowledge) and the concept of the justification of property (working instead of contract). In his two works on government, Locke indicated that first of all, traditional natural law is based on “the complex of instinct-law-norm”. The natural law is taken its principles from human-god relationship. In accordance with assumption that God has not created nothing without a reason, the instinct and skills of humans has not created coincidentally either. According to Locke, God has equipped humans with “a strong biophilia” by creating them. Likewise, he created earth for this purpose. He gave human to sanity for using these skills. “Humans must live” in accordance with the law and will of God. From this point of view, Locke constitute the mentality of domination towards the essential goods for survival and the assets of low quality. “God gave the right of confiscation and authorization command”. At this point, Locke distinguishes property right and sovereignty right prominently. The term of property which “only serves its owner’s welfare and benefit” is valid only in the direction of god’s command and as a part of god’s ego-centric will (Euchner,1979:202-204). Private property is an artificial and conventional product of humans. Private property in these traditional stances, which is dominant from Cicero until 17th century, is not based on the mentality of natural law. A primordial community of goods is a starting point for the root of this thought. According to this thought, collective ownership is the command of God or a natural law depend on it. Later, this thought depended on Aristo and because the undetermined distribution caused dissatisfaction and humans escaped to work egotistically for the sake of community, common property degenerated. This condition cause to arise the private property. In here, the sum of the goods, which also includes capital goods and consumers goods as well, is intended (Aristotle,2003:147, Aquin, 1985:315). If the subject was the distribution of goods, then, there was

---

1 Locke’s justification of inheritance also follows the complex of instinct-norm-law as well. Sex instinct is given by God for the continuity of humankind which contains the right of nutrition-housing.
a occupatio-rule\(^2\): The individual, who obtained an object without an owner, can be accepted for his claim on it and for being a legal property owner. In this regard, though, private property is equal to the nature of sinner but it is not a natural law which (god commanded). The law created by humans is not a human right only. Because its social and conventional characteristics (it only exists with everyone’s approval, although it is not rational, it can be removed any time in principle), it is a social law. Wealth is limited, and it cannot be multiplied. Because of social obligations and character, another theory of the innate constitutes the limited quantity of goods on the world, that is, the zero-quantity theory of wealth (Reinhard, 1974:45). If someone has more, then, another individual has less, after all, the goods on earth cannot be multiplied and this can be clashed with god’s command. Because “the usage of old covenant” needs continuation, as if “all goods are like common” (Locke,1998:46).

Locke defended his idea in his old works. “Food, clothing, jewelry, wealth etc. are all for consumption. If an individual consumed as long as he could, he would take another individual’s piece and if an individual became rich, then, its cost was supplied by another individual” (Locke,1998:35-46).

However, sovereignty is a social obligation. The legal sovereignty of human on another human is natural. Aristotle’s “Politics” influenced Locke especially. Aristotle indicates that “there are several kinds of ruler and naturally, ruled as well”. Free man have control over slaves, men, women, fathers, maters and children absolutely (Aristo, 2003:73). Slave is envisioned as; not a diaonetic persona but having an intelligence to understand given orders. In addition, because slave has a high physical strength, he need to be kontrolled and dealt with physical works which can be done (Aristotle, 2003:53-73-74). In the works of Thomas Aquinas, this paradigm is used for the legitimization of absolutism (Aquin, 2004: 12). However, it is only passed on for considering what’s best for public welfare. Sovereignty is not a personal property but a representative function. It is aimed to protect everyone’s rights and properties. God commands human to work, but he does not recognize the right of sovereignty. The purpose of sovereignty is not survival but living as good and virtuous. In here, Aristo’s thoughts are paradigm as well; because it is understood that state (Polis) was not a residence community and it was not founded for preventing mutual injustices. Needles to say that these are necessities for the existence of state but not necessary for being a state. “A state will exist if and only a community of family and fellows live well, self-sufficient and perfect.” (Brocker,1992:24). State, though, is formed for the purpose of survival but sustain its existence for a good life. Good life is in the form of the fair behavior of the privileged and free men and the philosophical form of life for themselves. Locke started with the envision of optimistic man. People are often peaceful and collaborative in their natural mood. This optimistic perspective is suited with natural law which is given by God because the trust for natural law, which will be sovereign in the earth of God’s

\(^2\) However, the term of private property was different in ancient and medieval ages than current capitalist world which the mentality of its legality was different as well.
creation, can be found in this thought. However, there is no such element in natural law that will force to respect to this law. Therefore, everybody has self-law rights in natural law. But, because abuse of rights can always be occurred, this fundamental right cause wars. Locke accepted humans as good-natured basically (Locke, 1980:16). Locke's modernity is never arised from the radical rejection of creative-theological natural law argument paradigm but his specific shaping.

**Social Contract in Locke**

According to Locke, people make social contracts by gathering in political societies. The only purpose of this is the obligation to prevent the situation of warfare. Because humans are peaceful and collaborator, and equipped with unassignable rights naturally, social contracts necessitate only to renounce self-law in essence. However, this never includes to renounce personal rights like in Hobbes. Here, citizens only renounce their self-protection rights as long as state provided the security. Locke's state portrayal, that is “the union which constituted for the protection of life-liberty-wealth-property”, is appropriate for this thought. Hence, this definition of the protection of property formed the basis of state's purpose. The termination of natural phenomenon of warfare and the establishment of a reasonably safe environment are possible through a social contract which people will come and make themselves together. Mind, in other words natural law, paved the way for how to get rid of the constant warfare through the right of everyone to do everything. Physical power is the ultimate force which guarantees life and health for all humans and maintains the continuity of social contract by preventing the corruption of it. This force only materialized with the formation of the state (Euchner, 1979:212).

Hobbes explains the formation of the state in this way: “Men compromised about which person or delagation to procure the right to become their representatives by executing a contract” (Hobbes, 1994:63,137). The philosophers, who attributed the formation of state to a contract, have mostly a tendency to democratic thought. In case of Hobbes, he designed his social contract in a manner to support his views about absolute monarchy. According to him, the main purpose of social contract is to provide the safety of live and property. As long as sovereign provided the safety of his citizen's lives, everyone must bow down to him. “However, even for a legal punishment, if a sovereign attempted to kill or injure a citizen, a citizen had a liberty to resist against sovereign himself” (Şenel, 2008: 355).

---

3 Although this expression seems to be similar with Hobbes', it has a very different meaning. According to Hobbes, it is cannot expected from people to sustain a condition which has no safety of life and property. The fear of death, the wish of living peacefully and comfortable and the hope to own property with their self labor became the driving force for people to end the war. However, only mind ensure to get rid of war conditions and to create the peace conditions which people can make a compromise with each other. These conditions which obtained with mind is called as natural laws. For Hobbes, “natural law, lex naturalis, is can be found with mind and prohibit hazardous or detractive things that impair people's own life and their protection or it is a principle or canon which people thought the best way to protect their lives.” (Hobbes, 1994:62, 103,104).
The state which built on social contract in Locke is a liberal state of law rather than a monarchist state. The function of state is limited with protecting the state of nature before contract and validation of it. State; is not the creator/provenance of social contract or state law, only a guarantor of personal liberty laws before the contract. Therefore, state law should never be absolute. State reached its limit when it interfered with citizen’s life-liberty-property field. In parallel with this purpose, Locke demanded a separation of powers within the state also (Locke, 1980:86). Thus, he stipulated a resistance right unlike Hobbes who rejected it categorically. If government or legislator ruin this contract, people have the right to revolt. Because state authority annulled contract in some way, self-law right in habitat reappeared. According to Locke, state authority should be limited categorically and it must be respectful for personal liberty rights, primarily life, liberty and property. However, Locke’s idea of a liberal state of law is not defined completely in this manner. State is not only responsible for to be respectful to these rights but also it is obligated to protect them which is the purpose of state formation. Locke’s attributed duties to state are just being a state of law and to protect liberties. Apart from these, general welfare and social justice are not counted in state duties. For him, social justice is equal to be a state of law and protect liberties. About welfare, however, state authority is not responsible for it generally. To provide welfare is considered rather a duty of citizens (Locke, 1998: 12-26).

Locke’s social theory contains a very important prerequisite. According to this, if a society has extensive liberties only everybody use their properties, that society can live in prosperity and aforementioned justice. Basically, he foretold the theory of “invisible hand” in this manner. Yet, this doctrine is developed by Scottish spiritual philosopher and economist Adam Smith after half century. The social philosophy of liberalism experienced an important integration, which maintained its influence until today, with this doctrine. With his famous work in 1776, “An Inquiry into The Nature and Causes of The Wealth of Nations”, Adam Smith was tried to prove that self-interest-oriented behaviour provided the best general benefit. Two conditions need to be provided for this and these are the liberty of markets and the protection of personal rights by the state. He mentioned the protection of local market by imports in another chapter of his book. In this context, he indicated that a mechanism is active to provide the harmony of free market and this guaranteed that self-interests (partial) reached to general welfare. Smith formulated the general pattern of liberal justice philosophy completely in this way. The general welfare which will be provided by the state is redundant, because citizens created it themselves (if the state is not interfered with citizen’s business) and furthermore, even if they do not desire it directly, it is sufficient to follow their pure self-interests (Smith, 1776:85-96). Likewise, “social justice” is not the legal target of politics as well, markets provided it eventually. In conclusion, although the relevant term has not been mentioned in both Smith and Locke, the concept of the performance justice of typical liberalism could be found.
Labor Theory of Property And Its Natural Law

According to Locke, life, liberty and property are unassignable rights which are the state of nature in a peace environment formed by God. Therefore, there are exclusive privileges, equal liberty areas and the rules of basic ownership in state of nature. However, apart from equal liberty areas, there are second-level procedures. Every state of nature is each person’s self-law right, the protection of life-liberty-property right and practice right. The regulation and execution of law in state of nature is the counterpart of divine punishment execution in earth. Even God-Human relationship is evaluated in property pursuant to the working concept of creator theology. “Men are the property of God because they are his creation” (Locke). State of nature is also involved with “personal liberty” of each person which is the permission to act in accordance with motu proprio. Because for Locke, if a person surrendered to the will of another person, s/he could be killed by him/her. Locke’s claim of equal liberty of each person is depended on creator theory. Since they are servants of God similarly, they have the same rights about freedom-justice which the difference of physical and mental skills does not change the circumstance herein. In this regard, the contracts which serve to pure enslavement is invalid because humans cannot renounce a thing which they never owned. Thus, state of nature is “totally a state of liberty within the scope of applicable laws.” An illegal environment is a nonliberal environment because “there is no liberty in a place where has no laws.” Liberty means being distant from coercion and constraint. “Liberty is not possible where law does not exist.” (Locke, 1998:25-52).

God gave the property jointly to the ones who build the earth. At this point, there is no original privilege on property. According to Locke, there should be methods to turn uncultivated nature to property because “god does not want an uncultivated earth, in other words, he does not want a constant collective ownership and an uncivilized earth” (Locke, 1998:12-26). Seisin is taken by on the basis of person’s pure self essence. Soul and body are the execution of this. This right, which is obtained from the extended natural law, actualized on the usage of no man’s land. Humans added their own power on unclaimed habitat. A transfer right is formed in this way. A third person does not have any right to take on labor production which is not even left for a worker who worked sufficiently. A connection to traditional natural law can be seen herein. This “material sufficiency” created first property barrier in natural universe before money. Second material is not to stipulate sufficient product just for others. It brought the stipulation of not to corrupt the product of others at the same time. This “seizure of material” created the second barrier. “Humans can generate properties as long as they need for their life but only for not to corrupt it.” Because nothing is created by God without a reason. God gave the earth to humans only for their maintenance. Nothing is created by God just because humans mess them up (Locke, 1998:18-20). But these two barriers are contradictory with Locke’s theory of property or are completely insignificant in terms of their priorities. “Material sufficiency” is against the primary social character of propert acquisition which is contrary to the resource wealth of habitat in Locke’s assumption (Locke, 1998: 23,66). This resource slack has a mentality to keep
good and fertile lands rather than to feed the poors who needed them. It hinders the material damage in condition of others’ possession of poverty after its owner left it from the very beginning. As a result, the situation of leaving the land behind is not possible because the labor force leads to a multiplication of goods both in quantity and in quality. Prohibition of misappropriation have absurdities in the end because rotten products became no man’s property by disappearing physically. These questions lost their meaning with the emerge of money. These property limits contains the first state of earth and contemporary America in those ages. These laws are bypassed with the invention of money. As a result of this, the social consequences of these approved silently with a compromise on the usage of money. The invention of money and the silent alliance of humans on valuation of it, enabled the more acquisition of wealth and its right by “the real usage of things”.

Locke displays a primordial value theory in the section of theory of money. Humanitarian life depends on “the value of things” in respect of their usage (Locke, 1998:17-27,98). The value which is equal to usage value is placed here with the conception of money as a thing because conventional value which is formed with a result of compromise is given to it which has to be the same value with material usages. The usage of money is symbolized accordingly and its value is not given naturally. The inventory of earth and joint wealth of humanity increased with the cultivation of no man’s land eventually. From these point of views, Locke tried to determine labor value and usage value. Labor valued everything differently. The improvement of uncultivated land as a result of labor is generated the large part because production goods are leant on labor by nine-tenth of it and this composed the large part of its cost. The fact that bread is more valuable than nutgall and the wine is more valuable than water are the result of human effort purely. The increase on these is seen as equivalent with value increase by based on the quantification principle of usage value. It is distinctive that labor generated the large part of its value for Locke. The labor which is used during the work determines the value. “Sowing, cutting or hard labor in bakery should be taken in consideration definitely” (Locke, 1998:36-39). Locke’s labor theory of property transformed to encouragement theory and the labor theory of value of wealth. Later, Smith will formulate it in this manner. Smith absorbed many principals of Locke in a similar manner herein.

However, Locke’s monetary theory of value is directly beside to labor theory of value. At this point, he identified the specific collectivism of capitalist wealth with natural qualities on one hand and basic social conventions on the other. However, the real social character of wealth get lost between nature and convention (Rotermundt, 1976:71). Locke surpasses the zero-sum theory in the end and tried to found that social inequality is appropriate for natural law. Ex-

---

4 Marx was right to say that “Locke’s philosophy constituted the bedrock of British economy in later”. (Marx, Theories, pp. 343).

5 Rotermundt, 1976:71, In his theory, Locke directed his attention to this dualism. “The dual character of goods”, which is not comprehended by Locke, transformed into the dualism of value of goods (based on concrete labor) and value of money (based on the compromise of humanity).
change with less corrupted goods and uncorrupted money is rational which output growth goes beyond its livelihood standard. This is not only rational for producers but also is rational for society because the wealth of individual and the quantity of goods in society increased in this manner. At this point, money explains the inequality of property by base on the varied labor of people. It is the driving force of limitless property acquisition, means of production and the inventory of humanity. Productivity-based social injustice is accepted because of the silence to limitless acquisition. Locke attributed natural law about dayworkers again herein because nature wants from humans to guarantee their life and does not say anything about whether it should be independent or not. This contains whether it is an original acquisition or acquisition from exchange. Following this, he used the expression of “the property of worker is his body and hands”. Dayworkers are in bound to labor theory only if the capitalist cultivates the land entirely in advance and obtains the means of production by means of exchange or method in this context. Locke ignored the structural obligation of labor force sale in consequence and he did not realize that daily relationship of work-capital is based on exploitation. In addition, it is more important that Locke evaluated money as a capital unconsciously since the beginning of his works. Money should be grounded the variation of capital with limitless wealth accumulation. Everyone can save the goods which are not corrupted but their needs and can be exchanged with every goods but they can do this only earning new lands and utilizing existing lands in a better way. At this point, Rotermundt indicated righteously that this is only possible with using labor force of foreigners (Rotermundt, 1976:89).

The Weak Points of Locke’s Labor Theory of Property

The justification of property doctrine is very important for Locke’s perception of social justice. The perception of property at this issue is not wide (it is not involved with the right of life, liberty and estate), it only contains land property herein. Needless to say, it should not be forgotten that land was a determinant means of production in the agrarian society of 17th century at this point. Other means of production and capital was at low importance in that age. Hence, Locke’s labor theory of property justifies the real means of production’s ownership on private property. This was one of the paramount problems in social justice undoubtedly. The property right on land is a natural right for Locke, that’s the reason why it is above than social contract. As a result of this, no state is not authorized to cancel or to limit this natural right. Even it is the opposite, and the protection of private property and binding over the other natural rights are among the main duties of state. Beyond any doubt, Locke is aware that the given land right to one individual is superseded the right of another individual on land and for this, he is conscious about the necessity of an ethical legality on private property. This indicated itself as a theological rule in Locke (Locke, 1998:56-78). God gave the earth to all people jointly. However, this raised the question that how the collective ownership given by god can be transformed into private property.
At this point, it should not be forgotten that Locke is not obligated to handle this subject and he can put away the hypothesis of original commandments of god (it also includes first ownership and the principle of owning no man’s land). However, his mention towards this and his desire to legitimize private property arised from his Christian belief and his thought of every individual is equal in front of God eventually. Yet, ethical problem can be considered without a theological-metaphysical thought. If we think that every human is same in principle and no one’s origin or personal qualities provide a moral advantage, then, there are no law of powerfuls or right of lucky persons. In order the land to be one’s right, conventional legal arguments is needed. Therefore, this condition can be accepted by weaks and unlucky persons.

Locke formulated the famous solution of this problem in this way: One individual obtained this right through the cultivation of land, which is a personal labor and in this way, that individual can earn the partial ownership of this land which is everyone’s right actually. The land right is also a result of self-made labor which bounds the right of individual on self (Locke, 1998:56-78).

According to Locke, this ownership right has two limitations: (Locke, 1998: 78-79)

1. The land surplus have to be and adequate land should remain for others (Locke, 1998: 78-79).
2. The ownership of this issue is limited with self-usage and self-need. Thus, a person has the right to own land as much as s/he consume only (Locke, 1998: 78-79).

Locke had a great difficulty about this stipulation because there were huge land properties in 17th century England. However, in order to justify private property on land, he used some auxillary constructions. Yet, these are not very convincing in essence totally. He explained the matter of first stipulation which is the land surplus with the reason that there are too many uncultivated land in earth shortly. For ths second stipulation which is self-usage and self-need, he found an original way out. The moral objection about the ownership of land disappeared with the invention of money because the surplus production is sold eventually and these products are not corrupting and is consumed by consumers in this manner.

Property was a right given by god in the view before modernity and Locke’s property theory includes an important theoretical innovation in this regard. The justification of private property on the means of production of private property is evaluated on only the performance of its owner. This is a progressive and pioneer idea but Locke put this principle over its limits and shaped it through the benefits of wealthy class. When we looked at the weak points of his theory, we could see this so easily:

1. By cultivating the land, only the products of that specific land are justified, not the property of land itself because there is no objection to stay this land in collective ownership, since workers can get in return for their labor eventually.
2. The subject of landlordship is not evaluated with only the land surplus and it is not based on land shortage.

3. In addition, the matter of first ownership was evaluated as the first cultivation of land but there was no inheritance factor.

4. At this point, only the property owner who produces the land for his/her own need is justified, not the landlords or huge landlords because a property right which is justified through personal labor is only available for self-operation, never justifies the operation of slave-approach-tenant.

In conclusion, we can see that Locke’s study on land right could never justified the few noble landlords who obtained most of the lands in 17th century England. Moreover, it is obvious that his labor theory of property cannot be adopted in the subject of ownership of means of production in advanced capitalism because objective capital can be multiplied as required besides the land of limited usage field.

The Paradigm of Liberal Justice

It is seen that the paradigm transformation of early new age and the tendency to normative individualism materialized with the liberalism which is founded by Locke. The paradigm of liberal justice is shaped around four principles in this regard:

1. The primary target of a fair order, the state and economy is the protection of personal liberties.

2. All men are equal before the law.

3. Personal liberties conditioned the minimization of state’s influence as far as possible.

4. Private property is at the center of personal liberties (Locke, 1998.98-102).

The importance of private property is dominant in Locke because it is not possible to comprehend the justice concept of liberalism without it. According to this, the starting point of liberalism is not social dependency anymore, instead, it is based on the thought of free and independent person. However, the guarantor of this independence is private property and therefore, this has to be the major component of liberty for liberalism. In this sense, it is possible to see that the origin of ethical justification of property and its legal basis have an importance for every classical liberal theoreticians.

Though, only land ownership is the subject in 17th and 18th century but the labor theory of property in liberalism mostly tried to legitimize the property of means of production in essence. Private property play a fundamental role for the liberty of individuals and self determination in liberal justice theory. However, the reality of most of the people, who were not a significant landowner, was not a justice problem for Locke. This limitation on wealthy class
became a hypothec for all liberal tradition in later. The justice paradigm, which is pretty influential until today, was founded mostly by Locke (1632-1704). Normative individualism formed the basis of liberal justice paradigm. The life norms in social union should be earned from the personal liberty rights which is accepted in a higher level, and should be legitimized towards it. Locke started from optimal anthropological precessors/presuppositions. According to this sense, humans are peaceful and collaborator in state of nature (before the formation of state authority). He represents a moderate variation of social theory. Norms were not created or based on social contract in essence according to this. Further, it was created by God and a valid law of nature existed before the contract which was understood as personal liberty right in essence. State authority is just institutionalized through social contract which applies law of nature (that is the law oriented to the life right of every human) in practice and it is on the way to prevent emerged oppositions. State – the purpose of social order and the paramount reason of its legitimization are purely and simply for to put personal right (life, liberty, property) under protection. Thus, the state authority reached its limits in these personal rights essentially. If the state authority transpassed the boundaries of these personal liberty, then, the legitimization of people’s resistance against this condition arose. According to Locke, there is no goal of any state foundation beyond the protection of fundamental rights (for instance, social welfare and social justice). In this manner, social justice for Locke rested being a law state in the end (Locke,1980:98). Beyond that, general social welfare and social justice are provided by markets. Private property on means of production is legal because it has dwelt on self-acquisition right which based on “the condition of master of oneself”.

CONCLUSION

Locke is one of the most influential philosophers in modern era. Locke argued that liberty has been arised from human like equality. He treated freedom as indispensable, fundamental principle. Natural law which is bonded to God by Locke, provided all individuals with same rights. Natural rights cannot be assigned and these rights include the right of life-liberty-estate. Collective ownership is God’s command or is a natural law connected with this. The importance of private property is dominant in Locke because it is impossible to comprehend the justice concept of liberalism without it. Yet, the weakpoints has been found about the term of property in Locke. Landownership issue is evaluated as a part of having too much land merely and shortage of lands is not based. In case of sovereignty, it is a representative function. The purpose of sovereignty is not survival, instead, it is a good and virtuous life. He argued that the only purpose of political mechanism, which will be founded by a social mechanism where the will of all people will be included, is the protection of fundamental rights from state of nature (the protection of life, liberty and estate) and prioritisation of self-interests instead of raison d’état rather a tyrannic, illegal, oppressive rule or a rule which collected all mechanisms of sovereignty into a single body in a one-sided manner.
Locke emphasized that the absolute power of this administration should be boiled down to a certain level within the scope of liberalism and egalitarianism and this can only be actualized with the principle of “separation of powers”. To sum up, Locke left a legacy with his works, struggle and political philosophy as one of the most important philosophers in the history of social thought for latter philosophers.
REFERENCES

Aquinas, Thomas von. Summe der Theologie cilt 3, Stuttgart 1985, s. 315.

Aquinas, Thomas von. Über die Herrschaft der Fürsten, Stuttgart 2004, s. 12


Locke, J. I Versuch über den menschlichen Verstand. 2 Bde., Hamburg 2006;


PART III.
CHAP 6.

18TH CENTURY PROVINCIAL ADMINISTRATION OF OTTOMAN EMPIRE IN WAR ECONOMY: RAQQA PROVINCE (1730-1745)*

Tahir ÖĞÜT**

Introduction

The 18th century wars, that would witness the beginning of industrial revolution, were performed in an environment with developed technology, transformation in the field of military organization and based on the share of natural resources. European wars in this period were continued to be predicated on the financial accumulation of mercantilism with intensive usage of the domestic and foreign funds as well as state treasury. In the case of Ottoman Empire, she could not achieve the economic advance of Europe with the process of mercantilism and conducted wars for at the heart of the maintenance of her political position unlike her fellow Western counterparts. Ottoman Empire conducted her wars in the 18th century with the restriction of resources from her financial structure for supplying war costs because of an underdeveloped financial sector and the negative impacts of the transformation of global trade unlike Western Europe. The wars of Ottoman Empire in this period occurred in long duration and simultaneous or consecutive which is a major negative factor that a fighting state may face. In order to analyze the war organization and all conditions of Ottoman finance, the period of Sultan Mahmud I (1730-54) corresponded to an important turn due to the wars with Iran, Russia and Austria which happened consecutively or simultaneously. In order to determine the war finance and administrative and financial structure in its management totally, the evaluations of sub-administrative divisions through province scales will contribute for providing the consistency of analytical evaluations as well. In this context, Raqqa province became an important logistic base thanks to its large plains in the period of Mahmud I with the wars of Iran and its suitable position for river transportation from Baghdad to Basra through the Birecik sanjak.

* This text is prepared as the extended version of the paper of “Provincial Administration in terms of The War Finance of Ottoman Empire in 18th century – The Period of Raqqa Governor Rızvan Ahmed Pasha (1730-1745)” which was presented in “International Empirical Conference of Economy and Social Sciences” at Bandırma in 06/29-30/2018.
** Kilis 7 Aralık University,
The Political Landscape of Mahmud I Period

Although Ottoman Empire conquered the most important city of Iran, Tabriz, in the beginning of campaign, she is completely defeated as a result of this war with the shadow of huge land losses after Karlowitz Treaty (1699) in 18th century (Uzunçarşılı, 1995:167). After the fiasco of Persian campaigns, Patrona Halil Rebellion burst and with the abdication of Sultan Ahmed III, the period of Mahmud I began after the result of tensions in rebellion (Uzunçarşılı,1995:210). One of the important case in the first quarter of this period was the political and economic effects of Iran campaigns in 1722 which were initiated by the predecessor of Mahmud I, Ahmed III.

Sultan Mahmud started a new campaign in order to compensate the failure in Iran campaigns and he sent the governor of Erzurum and the serasker of Revan, Hekimoğlu Ali Pasha, to Tabriz campaign. Ali Pasha conquered Hamadan in 18 September 1731 and Tabriz in 4 December 1731 as a result of the campaign, and after these conquests, sultan began to use gazilik payesi (veteran title) (Uzunçarşılı, 1995:215).

The commander of Shah Tahmasp, Nader Afşar, seized control of Iran government after the loss of Tabriz. Nader Afşar gathered 100.000 man to army in order to gain reputation in 1733 and advanced towards Baghdad. The governor of Erzurum, Topal Osman Pasha, arrived to the siege of Baghdad and defeated the army of Nader Afşar. Yet, although Nader Afşar was defeated, he regrouped his army and captured Kirkuk and he could reinitiate the siege of Baghdad in January 1734. However, he offered a peace treaty to the governor of Baghdad, Ahmed Pasha, after his unsuccessful attempt to capture Baghdad (Uzunçarşılı, 1995:223). Nader Afşar, who began to use shah title from now on, retreated his army to Iran just after Baghdad Governor accepted his peace treaty (Uzunçarşılı, 1995:230). The new appointed the serasker of east, Abdullah Pasha, advanced towards Nader Shah upon his retreat to Iran and he came across with Persian troops in Baghavard but he was defeated in June 1735 by Persians, he retreated to Kars as defeated and died here (Uzunçarşılı, 1995:227).

The governor of Sivas, Ahmad Pasha, appointed as the new serasker of east over the loss of Abdullah Pasha against Persians. At this stage, Nader Shah had declared that he was ready to come to terms with Ottomans only if the circumstances of Murad IV would be reconstituted. Ottomans would accept his proposition and thus, the first stage of wars with Iran in 18th century ended in March 1736 that were started in Ahmed III period and proceeded for 13 years (Uzunçarşılı, 1995: 231).

The second stage of Persian campaigns started with the campaign of Nader Shah towards Kirkuk when Ottomans were battling with Russians and Austrians at the same time. After his conquest of Kirkuk, Nader Shah advanced towards Mosul firstly and then sieged Kars fortress. However, Shash was defeated in the siege of Kars and he was slaughtered by his commanders. Thus, the
period of Nader Shah, who saved Iran from destruction with Afghan, Ottoman and Russian assaults in 18th century, was ended. Although the murder of Nader Shah caused an extensive disorder in Iran, Mahmud I did not take advantage of the situation in Iran and he ended eastern campaigns (Uzuncaşılı, 1995:320). When Shah Ibrahim ascended to Persian throne after the murder of Nader Shah, he agreed the peace treaty which was made after the defeat of Kars and Persian Wars had ended in Mahmud I period (Kurtaran, 2011: 177-213).

It is possible to evaluate Persian campaigns of Ottoman Empire in 18th century in two stages. The first stage started by Ahmed III in 1723 and he aimed to conquer Iran. The first stage of Persian Wars caused the abdication of Ahmed III and eventually, it caused the period of Mahmud I. However, the end of first stage actually arrived at the conclusion with peace treaty of 1736 which aimed to maintain the borders from Sultan Murad IV period.

The second stage started with the attack of Iran towards Ottomans and concluded with the defeat of this country. However, although Ottomans had the important advantage to cause the possible conquest of Iran, Mahmud I came to an end these campaigns because he evaluated that these campaigns did not have any returns to both national economy and national politics. Briefly, during the period of Mahmut I, Iran's policy of Ottomans was based on "maintaining the status" as a basis of mutual respect for territorial integrity.

The wars with Russia and Austria broke out subsequently as a result of Persian Wars at the beginning of Mahmud I period. Russia had already occupied Northern Dagestan and Caspian shores at the beginning of Ottoman-Persian Wars by benefiting chaos. Russian tzarina Anna declared a war against Ottoman Empire which lost power in Persian Wars. The purpose of tzarina Anna with the declaration of war was to capture Azaq fortress and thus, to increase Russian influence in Caucasus region (Uzuncaşılı, 1995:251). Due to the attack on Azaq fortress by Russians, Mahmud I focused on war with Russia by finishing Persian campaign immediately. However, he did not know that Russian attacks would cause another declaration of war towards Ottomans and this would come from Austria. Sultan Mahmud attempted to prevent Russian advance by sending his grand vizier Hekim Ali Pasha to Azaq against Russian and Austrian equitemporaneous attacks. Ali Pasha successfully provided to repel Russian advance and he mobilized his troops towards Austria quickly. Hekim Ali Pasha had a great success and led his troops a decisive victory against Austrian troops in Austrian wars. Moreover, he retook Belgrade in September 1739 which was under occupation since 1717. Thanks to Belgrade treaty which was resulted in Ottoman's favor, the lost lands from Passarowitz treaty were retrieved partially (Uzuncaşılı, 1995:290).

After successful victories of Ottomans in Austrian front and the peace of these countries made Russians to realize that Ottomans could attack to them with a strong army. Eventually, they

---

1 Uğur Kurtaran, Ottoman-Persian Relationships in Mahmud I Period (1731-1747) with Consideration of New Sources, History Studies, 2011.
were obliged to declare a pact in 18 September 1739 to withdraw from the lands they occupied, especially Azaq and Khotyn fortresses. Pursuant to pact, Russians had to agree the conditions that allowed only Ottoman ships to trade in Black Sea (Uzunçarşılı, 1995:294).

Ottomans became victorious in all these three fronts which had occurred simultaneously or consecutively in the period of Mahmud I. The success of sultan was not limited only in military field and Ottoman state not only did not suffer from goods shortage but also her treasury was filled in Mahmud I’s period even in war environment until his death. When Osman III ascended to throne after Mahmud’s demise, he even did not need the receipts of “tecdit-berat” for fund-raising to distribute “cülüs bahşisleri” (bonus from Ottoman sultan to soldiers during his coronation) to qapıkulu soldiers as tradition requires this distribution for every coronation (Uzunçarşılı, 1995:320).

Raqqa Governor Rızvan Ahmed Pasha

Rızvan Ahmed Pasha appointed as Raqqa governor in 1730, when Mahmud I ascended to the throne, because his brother Hüseyin Pasha entered into Raqqa governor’s service with the reference (paye) of Rumeli Beylerbeyi (viceroy or governor-general of Rumelia). Until his dismissal in 1745, Ahmed Pasha became the longest serving governor of Raqqa. In other words, the governorship of Ahmed Pasha took place in the period of most successful padishah in 18th century Ottoman Empire.

When he started to his governorate in Raqqa, his term corresponded with Persian Wars. Because of Persian Wars, military mobilization were active in Raqqa province consistently until the end of war. Ahmed Pasha was charged to gather troops from tribes for the defence of Zor sanjak in 1732. The mobilization of vilayet sipahileri (provincial cavalrymen) to Baghdad fortress was commanded with the sending command to Raqqa alaybeğleri (regiment commanders). The janissaries of Raqqa also was in demand and sent to Baghdad fortress with another sending command to janissary commander-in-chiefs (serdar) in 1733. Süleyman Efendi, who was a mütesellim (tax-collector) and deputy-governor, when Ahmed Pasha was out of province, was in demand to hold left troops in Raqqa at disposal for a possible Austrian campaign (BOA, A.DVN. MHM.d.145, s.375).

Ahmed Pasha was appointed Anatolian inspector of middle branchroad in 1738. He obtained both administrative and judiciary authorizations in the line of his Anatolian inspector duty. His jurisdiction goes a long way from Adana to Aegean region (BOA, A.DVN. MHM.d.146, s.56). He obtained broad authorities upon mütesellims (tax collector) and governors of places where he went to discipline for the sake of his duty.

The most important task of Ahmed Pasha in his duty of Anatolian inspectorship was to repel the rebellion of Sarıbegoğlu in Teke. When Sarıbeğoğlu rebellion burst out, provincial
administrators did not put up a good fight against rebels because of Austrian campaign (BOA, A.DVN. MHM.d.145, p. 375). Ahmet Pasha was charged to eliminate brigands in Sivas after Sarıbeğoğlu rebellion was repelled (BOA, A.DVN. MHM.d.145, s.449).

Ahmed Pasha was inducted to Erzurum as serasker after his success in Sivas. He prepared 3000 soldiers at the level of kapı halkı when he was going to Erzurum as serasker. The prices of these soldiers would be paid by the treasury of Erzurum (BOA, A.DVN. MHM.d.148. s.244). The assignments of janissaries and sipahis to different places at the same time was the indicator that they were all conducted directly by central government throughout provinces except the troops of kapı halkı under the command of governor. Spreading soldiers in different classes at Anatolia was a practice towards to increase the mobilization of army completely. Therefore, it was aimed to prevent governors to turn themselves into power elites.

When Ahmed Pasha started his duty as the serasker of Erzurum in 1742, serious discipline problems happened among soldiers. The most concrete indicator of this situation was the usurpation of 25th and 79th ortas (an Ottoman military unit, similar to company) towards 40th ocak (an Ottoman military organization) which got their ulufes (service pay of qapıkulu units in Ottoman Empire) yet. This usurpation-oriented event turned into a conflict which caused many loss of lives (BOA, A.DVN. MHM.d.149. s.8). The indiscipline of soldiers generated pressure on people as well. The people in Erzurum country side escaped to Erzican, Tercan, Kemah in order to save themselves from the pressure on them and agricultural production in Erzurum collapsed completely (BOA, A.DVN. MHM.d.149. s.8.).

The indiscipline among the soldiers in Erzurum was infected to administers in the region. For instance, the beylerbeyi of Van could not collect the taxes because of the obstructive behaviors of the mütesellim of Adilcevaz from his has timar which consisted of 52 villages (BOA, A.DVN. MHM.d.149. s.39). Ahmed Pasha's duty as serasker was for to remove the amassed problems in Erzurum where was the logistic and supply base of Kars and Kars was the base of operations for Persian campaigns. In this context, troops was subjected to quick inventory and inspection, and soldiers who caused indiscipline would be cleaned from army. Initiatives would be started to convince escapee people to return Erzurum by contacting 200 influential persons who left Erzurum after military conflict. In case for people returned and transported the sent cereals to Erzurum from Trabzon pier, they were be promised to get seed aid (BOA, A.DVN. MHM.d.149. s.45). Ahmed Pasha disciplined military troops in Erzurum quickly and took measures about them for their possible escape from their winter quarters. He began to buy cereals in return for 80,000 gurş payment for cereal supply.

He helped the usher who was sent from Istanbul in order to create range corps which was substructure of essential communication system for campaigns. He provided an aid for cereals which was sent to route from Mardin to Van but massed into Tatvan pier immediately (BOA, A.DVN. MHM. d. 150, 66). He was inducted to a more strategic position, the guardianship
of Kars, thanks to the evaluation about successfulness on his duties in Erzurum as serasker. However, when he arrived to Kars with 3000 kapı halkı soldiers, he was instructed to return his permanent station Raqqa due to public order problems caused by Okçu İzzeddinli tribe in Kilis in 1744 (BOA, A.DVN. MHM.d. 151, s. 108).

**Administrative and Financial Transformation in 18th Century Wars**

The difference between armies were based on the skills of organization rather than technological differences, including continental Europe, from the beginning of 18th century to its end. Important variances happened in the organizational structures of armies in this century. The transformation of military organizations occurred with global economic development dependent on the financial structures of countries. European countries benefited from domestic and foreign loans for the wars they conducted in this period and the share of their debts in war finance increased to the levels of %75 (Kennedy, 1989:115).

From the Ottoman point of view, it corresponded to a period when Ottoman Empire had to battle with foreign powers in several fronts simultaneously for a long time in 18th century. However, unlike her European counterparts, Ottoman Empire did not have the means of foreign loans and could use domestic loans by necessity in war finance. Yet, Ottoman Empire had still a crucial role for Levant trade where Western and Eastern trade was very active intensively until the mid-18th century. However, Ottoman Empire even could not benefit from the possibilities of finding loans at this condition. On the other hand, one of the merchants in British-invested The Levant Company, which was active in Eastern trade, Paul Pindar could give the requested loans for the war finance of British monarch thanks to his fortune from Ottoman trade (Wood, 1964:84). The situation in this example is the impact of political preference consequences rather than an economic accumulation problem.

The achievements on wars was depended to the results of successful or ineffective financial organization inevitably because of the restriction effect of loan possibilities. Ottoman financial system consisted of internal and external treasury fittingly to the military organization structure of state. External treasury was organized for the needs of palace and the balance of financial structures. The most important factor of war finance for Ottomans, internal treasury, was organized through the unit of Hazine-i Amire (Imperial Treasury). While Taxes associated with Hazine-i Amire could be conducted through the organizations of “muhassilliklar” (the unit of tax collectors), in other words, they could be conducted through central treasury directly, provincial administrations were conducted through provincial treasures.

The war finance in Ottoman Empire before 18th century both did not generate any destructive effects on Ottoman financial system and provided an opportunity for economy to regenerate itself through conquests (Cezar, 1989: 27). However, structural transformations became
mandatory after the differentiation of the impact of wars on economy and financial system in 18th century.

Ottoman Empire was organized through 28 eyalets (state) in conformity with the economic self-sufficiency criteria (Özkaya, 1985:19). Some of these provinces were administered as both muhasıllıklık and state treasury like the example of Halep eyalet in the end of 17th century. The management of “mukataa” revenues in muhasıllıklık administration was conducted by muhasıls who were sent by central government (Çakır, 2018:128). Mukataas were a holding deal between state and farmers unilaterally in general (İnalcık, 2000:215).

In the case of a transition of financial revenues management to muhasıllık, a transformation took place also in administrative structure as well. The transitions of financial structures in provincial administrations were performed with the removal of provincial treasury in a most concrete way like the example of the province of Halep (Özvar, 2003:102). The transition from provincial treasury to muhasıllık administration was aimed to increase state influence in financial management. However, the expansion of this practice was limited with the intensity of tax revenues and the easiness of tax revenues in specific province.

The head of provincial organizations, governors, began to be elected among viziers thanks to the expansion of vizier position in 18th century (Özkaya, 1985; 19). Due to the long duration of the campaigns in this period, the governors were generally located on the fronts in wars, and the potential weaknesses in administrative and financial management were highly possible. In order to minimize these kind of problems in provinces, state imposed an obligation for governors to appoint a mütesellim as deputy-governor when they were in fronts (Çakır, 2003:128). One of the practices to prevent administrative weaknesses, when governors were out of the province, was to charge reliable families in provinces with guardianship duty which was a general practice of Ottoman Empire in her every period (Akdağ, 1994: 209). For instance, Ben-i Kays tribe was in the position of guardianship in Urfa (BOA, A.DVN. MHM.d. 151, s. 54).

The transformation of financial system was determinant as far as the change of administrative structure in the transformation of Ottoman financial system in 18th century. Due to the pressure of wars on financial system, the revenues of central treasury were linked to “malikanes” (tax-farming) in 1695. The revenue group which was called has taxes and this was imposed in exchange for the revenues of padişah and ricali, was also linked to malikanes in 1697 (Cezar, 1989:35). The reason of has taxes converted to mukataa was on the grounds that baş defterdar (head of provincial treasury), governor and sanjak beys were in long duration campaigns (Cezar, 1989:66).

The financial structure in 18th century aimed to reorganize the distribution of resources as far as to increase revenues as well. For example, in order to compensate the revenue losses because of the transition of treasury revenues, which was the centre of governor and sanjak beys’ has
revenues, into mukataas, imdad-ı hazariye and seferiye taxes were transferred to these officers (BOA, A. DVN, MHM. d. 147, s. 138). While the half of imdad-ı hazariye and seferiye taxes were given to governors and sanjak beys due to the transitions of has taxes into mukataas, the other half of these taxes revenues was connected to kapı halkı employment for to consume 70 gurüş per capita. Imdad-ı hazariye taxes were determined as 10.000 gurüş and seferiye taxes were determined as 25.000 gurüş and they were collected at Raqqa province in 1736 (Cezar, 1989:59).

However, since administrators could not benefit from the precautions to prevent the revenue losses, they tended towards to impose illegal “tekalifi şakka” taxes and they did not refrain themselves to enhance abuses towards taw payers (Cezar, 1989:45). In order to compensate the emergent problems of financial system, imdad-ı seferiye taxes were collected in different amounts according to the provinces’ ability to pay. The bindingness of sanjak decrees, which adjusted the tax types and their prices for tax payers, was partially suspended in this tax practice at least with differentiated amounts of imdad-ı seferiye collecting by connecting them to provincial scale (Akdağ, 1994:46).

Administrative and Financial Transformation in Raqqa Province

Raqqa province consisted of the sanjaks of Birecik and Ruha (Urfa). It was encircled with the provinces of Diyarbekir in north, Halep in south and, Maraş in west. Raqqa province was a wreck city and not a settlement under the Ottoman domination. The reason to call this city as Raqqa was the respect for Abbasid Caliphate because the city was used as seat of government in the period of Harun al-Rashid. The transformation of Ruha into Urfa began officially after the period of Tanzimat (1839) process. However, the name of Urfa was discovered in a mühimme defteri dated 1744 through an official document (BOA, A. DVN. MHM. d. 151, s. 67).

Raqqa was one of the provinces that had the provincial treasury in accordance with the pattern of financial organization in 18th century commonly. Therefore, Raqqa treasury had to fulfil its financial obligations in Persian campaigns period through its status for campaigns. Its treasury was actually made up for war budget like every single traditional budget (Tabakoğlu, 2012:287). The state institutions of Ottomans with its strict and absolute structure also regulated fiscal finance structure as well (Acemoğlu-Robinson, 2013: 116).

Ottoman Empire moved into a malikane system with the operation of mukataas in 18th century. Mukataaa was an important reform and corresponded as a term which determined the sources of taxations. Malikena was a system that entitled mültezims to operate tendered mukataas with life innuity. Raqqa province was determined to be a pilot place for the implementation of malikane system (Öğüt, 2013:217).

In order to provide efficiency of malikane system in Raqqa province in 18th century, “ber vech-i malikane” term was used for the appointed governors to this province. The term of ber
vech-i malikane enabled them to collect mukataas in exchange of the revenues of military class directly. Raqqa governos holded the rank of “vali iltizami mukataasi” thanks to their appointment with “ber vech-i malikane”. Governors had the authority to unify low efficient mukataas into high efficient mukataas and to create a new iltizam structure thanks to the authorization of “vali iltizami mukataasi” rank. Hence, governors were shouldered a responsibility to balance for the distribution of mukataas in different levels of efficiency (Çakır,2003:160). The appointments of Raqqa governors as “ber vech-i malikane” were also the reasons that Raqqa became a residential area and the necessity to break the tax payment resistance of tribes and to discipline them ( BOA, A.DVN. MHM.d.148. s.246).

It is possible to see the classifications of unifications and degradations of malikanes in the beginning of 18th century thanks to Erol Özvar’s valuable work with the examples of Diyarbekir, which had provincial treasury, and Halep, which had the financial management of muhasillik and they were the neighbours of Raqqa province as well.

**Diagram 1; The Distributions of the Village and Hamlet Mukataas in the Malikane of Halep in 18th Century**

<table>
<thead>
<tr>
<th>Village and Hamlet Community</th>
<th>Their Rates in General Malikanes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malikanes Consisted of One Village or One Hamlet</td>
<td>11.75</td>
</tr>
<tr>
<td>Malikanes Consisted of Two Villages or Two Hamlets</td>
<td>6.73</td>
</tr>
<tr>
<td>Communities Consisted of More Than Two Villages or Two Hamlets</td>
<td>59</td>
</tr>
</tbody>
</table>

**Source:** Erol Özvar, Osmanlı Maliyesinde Malikane Uygulamalari, Kitapevi, İstanbul, 2003, p.105.

The distribution of malikanes in Diyarbekir where the mukataas were managed by provincial treasury unlike Halep;

**Diagram 2; The Distributions of Village and Hamlet Mukataas at Diyarbekir in the beginning of 18th century:**

<table>
<thead>
<tr>
<th>Village and Hamlet Community</th>
<th>Their Rates in General Malikanes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malikanes Consisted of One Village or One Hamlet</td>
<td>27</td>
</tr>
<tr>
<td>Malikanes Consisted of Two Villages or Two Hamlets</td>
<td>22</td>
</tr>
<tr>
<td>Malikanes Consisted of Three Villages or Three Hamlets</td>
<td>22</td>
</tr>
<tr>
<td>Malikanes Consisted of Four Villages or Four Hamlets</td>
<td>8.5</td>
</tr>
</tbody>
</table>

**Source:** Erol Özvar, Osmanlı Maliyesinde Malikane Uygulamalari, Kitapevi, İstanbul, 2003, p.116.
As it can be seen from above diagrams, mukataa unifications and degradations were different from each other on the basis of provinces for the formation of malikanes. These alterations between provinces were differentiated with some reasons like the difference of economic and administrative activity.

Raqqa province had a financial structure with increasing revenues since the beginning of 18th century. The increasing revenues in this province originated from wide savings of senior accounting office through Halep treasury which had the status of muhasıllık. Because this removed the approval conditions of governors for saving transfers. Hence, Birecik pier and Rumkale mukataas transferred from the muhasıllık of Halep to Raqqa treasury thanks to this system. While the revenues of Raqqa treasury were 60.000 guruş per annum, they became 120.000 guruş as a result of the transfers through the muhasıllık of Halep (Öğüt, 2013:149). The transfers to Raqqa treasuries were not limited with the mukataas of muhasıllık of Halep. It also involved with transfer examples from Haremeyn Accounting which was a central financial unit. These examples matched with the examples of 1698 (Çakır, 2003:96). Hence, while the revenues of Raqqa treasury was 60.000 guruş in 1695, the transfers of Suruç's has mukataas with 20.000 guruş in the same year and Birecik pier mukataas from the muhasıllık of Halep in 1709 into Raqqa treasury were increased the revenues of treasury from 20.000 guruş to 100.000 guruş.

The ratio of the revenues of Raqqa treasury corresponded with the revenues of senior accounting office and its ratio was %1 (Öğüt, 2013: 146). The revenues of provincial treasury increased to 119.000 guruş with the revenues of mukataa of Harran and included mukataas of karyes (villages) into tax system. Annual benefit raised to 202.501 guruş in the most extensive calculations of provincial treasury in Ahmed Pasha period. The primary reason of this radical increase origined from the factors of the raise of mukataas of customs from 14.500 guruş in 1713 to 31.500 guruş in 1733, the raise of Birecik pier mukataa approximately from 25.500 guruş to 41.500 guruş and the raise of malikanes of karye from 10.000 guruş level in 1713 to 19.000 guruş in later (Öğüt, 154: 2013).

The calculations of expenditures made at Raqqa province in 1739. The expenditures of Raqqa treasury were 108.911 guruş in this period. The 40.000 guruş part of expenditures in treasury used for buying provisions to Baghdad, the 20.000 guruş part of expenditures used for the transportation of provisions in Euphrates River and the rest of it consisted of the has of Şevki Paşa and mevacip payments for military personnel (Öğüt, 2013: 160). However, it should not be concluded that the obligation of Raqqa treasury for Persian campaigns was not only from the provincial treasury. Because the command of building ships at Birecik in 1733 built with the directive of senior accounting office and from a 25.000 guruş transfer in the account of muhasıllık of Halep (Özkaya, 1985:52).

Revenue increases in provincial treasury for a short time and the success of revenues to meet expenditures were the result of war economy which increased its influence in the administrative
and financial management of Raqqa province. Another important issue in Ottoman financial reform was that the practice of malikane system in mukataas by múltezims to operate them with life innuity.

Muaccele price (the price of mukataa and malikane tenders) was conceptualized as tender price and the %10 of this price, which was annual, was named as “mal bedeli” (cost). However, the contributions of malikanes for financial system was not limited with these payment styles. They also provided to form a remarkable tax unit and this unit was called as “cebelü bedeli”. Sent edict in 1737 to Raqqa governorate; The collection of the cebelü prices as 50 guruş in return for each malikane keeper’s 1000 guruş muaccele (tender cash price) of unit of values requested and the seizures of malikanes by governor was in demand for the keepers, who could not pay their prices. The collection of cebelü prices was justified for the military expenses in campaign period (BOA, A.DVN. MHM.d.145, 1737:10.).

Ottoman State battled with foes in three fronts continuously from 1732 to 1754 in the period of Mahmud I. However, state met the expenses of war finance even in this long duration war period. I. III. Osman and III. Mustafa even did not need the collection of tecdid-i berat (replenishment) for culus tips thanks to sufficient funds in treasury. Moreover, the surplus funds in state treasury in III. Mustafa Period was determinant to declare a war against Russia in 1768 (Cezar, 1989:74). The dynamism of economy and being still a huge military power were the factors for the success of Ottoman Empire’s war finance at the beginning of 18th century. However, the integrated structure of Ottoman Empire with world economy was began to be degenerated due to the wars with Iran, Austria and Russia in 1760s (Davis, 1967: 122).

The Place of Settlement Policies in the Transformation of Financial System

Ottoman Empire began to practice an extensive settlement policies for tribes in order to increase financial incomes and to develop administrative activity in the process leading to 1699 Karlowitz Treaty (Halaçoğlu-2006:78). Raqqa province was one of the outstanding provinces for the settlement policies of tribes in 18th century. The main purpose of settlement policies was production and the policy of increasing financial incomes (Barkan, 2000: 555-578). Although it was aimed to provide economic growth and financial activites with settlement policy, the resistance tendency of tribes against settlement policies was powerful either due to their relations of production based on their nomadic status (Özkaya, 1985:172).

Prior to Ahmed Pasha’s appointment to Raqqa, it became an important base for settlement policies of tribes. These tribes;
18TH CENTURY PROVINCIAL ADMINISTRATION OF OTTOMAN EMPIRE IN WAR ECONOMY:
RAQQA PROVINCE (1730-1745)
Tahir OGUT

Diagram 3; The Tribe Settlements of 18th Century Before Ahmed Pasha

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Where They Came From</th>
<th>The Location of Settlement</th>
<th>The Reason of Settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1691</td>
<td>Tacirli</td>
<td>Kınık- Ayas- Berendi</td>
<td>Harran</td>
<td>Banditry</td>
</tr>
<tr>
<td>1692</td>
<td>Anterli</td>
<td>Tokat- Sivas</td>
<td>Belih Çayı- Fırat Nehri</td>
<td>For Discipline</td>
</tr>
<tr>
<td>1692</td>
<td>Mamalu</td>
<td>Tokat</td>
<td>Harran</td>
<td>Banditry</td>
</tr>
<tr>
<td>1701</td>
<td>Mamalu</td>
<td>Tokat</td>
<td>Harran</td>
<td>Banditry</td>
</tr>
<tr>
<td>1701</td>
<td>Çepni-Hacalu-Elçi-</td>
<td>Muhtelif</td>
<td>Colab</td>
<td>For Discipline</td>
</tr>
<tr>
<td></td>
<td>Kılıçlı Cemaatleri</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1702-12</td>
<td>Afsar</td>
<td>Yeniil</td>
<td>Belih</td>
<td>For Discipline</td>
</tr>
<tr>
<td>1703</td>
<td>Recepli Afsarı</td>
<td>-</td>
<td>Belih</td>
<td>Banditry</td>
</tr>
<tr>
<td>1703</td>
<td>Fettahli</td>
<td>Yeniil</td>
<td>Siverek- Belih</td>
<td>For Discipline</td>
</tr>
<tr>
<td>1703</td>
<td>İbrahim Kethüda</td>
<td>Yeniil</td>
<td>Belih</td>
<td>For Discipline</td>
</tr>
<tr>
<td>1703</td>
<td>Ali Kethüda</td>
<td>Yeniil</td>
<td>Belih</td>
<td>For Discipline</td>
</tr>
<tr>
<td>1704</td>
<td>Musacalu</td>
<td>Tarsus- Misis</td>
<td>Harran</td>
<td>Banditry</td>
</tr>
<tr>
<td>1705</td>
<td>Cihanbeğli</td>
<td>Çemişgezek-Palu-Kiğr</td>
<td>Belih</td>
<td>Banditry</td>
</tr>
<tr>
<td>1709</td>
<td>Zorganlu</td>
<td>-</td>
<td>Harran</td>
<td>Banditry</td>
</tr>
<tr>
<td>1709</td>
<td>Şeyhlü</td>
<td>Kilis</td>
<td>Harran</td>
<td>Banditry</td>
</tr>
<tr>
<td>1710</td>
<td>Koyunlu</td>
<td>Arapgir</td>
<td>Harran</td>
<td>Banditry</td>
</tr>
<tr>
<td>1712</td>
<td>Lekvanik</td>
<td>Kayseri</td>
<td>Belih</td>
<td>Banditry</td>
</tr>
<tr>
<td>1719</td>
<td>İzol</td>
<td>Malatya-Çobaş Nahiyesi</td>
<td>Bozabad</td>
<td>Banditry</td>
</tr>
<tr>
<td>1726</td>
<td>Şerefli Danışmendi</td>
<td>Kayseri- Niğde-</td>
<td>Belih</td>
<td>Banditry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirşehir</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Tahir Öğüt, 18-19.yy’da Birecik Sancağında İktisadi ve Sosyal Yapı, p.81, TTK, Ankara,

As it can be seen from above diagram, Belih Çayı and Harran subprovince were important places for extensive tribe settlements prior to Ahmed Pasha. Belih Çayı surfaces around Arus fountain from the south of Ruha, near to Harran subprovince. From this place, it merges with Euphrates River near to Raqqa by irrigating the area of Türkmen Colabı on south (Urfa Salnamesi, 1927:15). The most possible reason of the name of Belih Çayı originated from settled tribes in the area in 18th century. One of the reasons of the settlement of tribes into Beluh Çayı was indicated as “for discipline” in above-mentioned diagram. The first tribe that settled to
Raqqa for discipline in 1690 was İblikli tribe which was registered under the sanjak of Maraş. The reason of İblili Tribe’s settlement was the protection of euphrates river valley from Mevali tribe which was the centre of public order problems in Syria. However, public order problems did not occur after the practice of settlement. Even, İblikli Tribe became tax payers in return for 6000 guruş by recording them into Raqqa treasury in 1730 (BOA, 1730: A.DVN.MHM 141:8). This example was an indicator that safety concern was the priority rather than financial concerns for the settlements of tribes.

Another reason for settlement policy was to place disciplinable tribes in areas where they would not be seperated from other tribes geographically in order to prevent banditry activities. This situation was an indicator to ensure auto-control in new settlement areas. Besides, the purpose of tribe settlements were not only for the direct contribution to production process but also involved with military purposes (Barkan, 2000:555-578).

It is quite difficult to determine the contributions of settled tribes in Raqqa to financial system directly since they were registered to the mukataas of villages which they were settled (Çakır, 2003:188). For instance, the contribution of mukataaa of Suruç was 22.500 guruş to Raqqa treasury and the all taxpayers of Suruç were consisted of Berazi and Gökçeoyuk tribes (Öğüt, 201: 140). Yet, they were registered directly to the name of Suruç subprovince and their names were not indicated in the revenues of provincial treasury.

The leaders of tribes were called as “kethüda” in their social hierarchy. When they were settled, they were responsible to “voyvodas”, who were public tax collectors, since they became taxpayers. However, kethüdas got involved to financial system as complementary unit of voyvodas depend on the habits of tribes and they eventually became complementary tax collectors. For example, the assistance was received from kethüdas for the tax collection of one of the Rumkale subprovince tribes, Baziki, in their transition from nomadic life to permanent settlement (Öğüt, Küçük, 2015:47-75).

**Settlement Policy of Ahmed Pasha Period**

An external settlement policy involved with comers from out of province was made in Ahmed Pasha period (1730-45) and internal domestic policy was made also for nomadic tribes in the provincial region to complete their permanent settlement in the same period as well since the beginning of 18th century. This was an integrated period of these policies thanks to efforts of Ahmed Pasha. The settlement policy of Ahmed Pasha can be seen from following diagram;
### Diagram 4; The Settlement in Ahmed Pasha Period (1730-45)

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Where They Came From</th>
<th>The Location of Settlement</th>
<th>The Reason of Settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1731</td>
<td>Recepli Afşarı</td>
<td>Adana</td>
<td>Rakka</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1732</td>
<td>Okçu İzzeddinli</td>
<td>Kilis</td>
<td>Rakka</td>
<td>Banditry</td>
</tr>
<tr>
<td>1735</td>
<td>Barak</td>
<td>Ayaş</td>
<td>Nizip</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1735</td>
<td>Kiki</td>
<td>Mardin</td>
<td>Mardin</td>
<td>Banditry</td>
</tr>
<tr>
<td>1735</td>
<td>Bektaşlı- Kılıçlı</td>
<td>Maraş-Kayseri</td>
<td>Rakka</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1736</td>
<td>Ulaşlı- Divaklı, Çakalli</td>
<td>Kafir Dağı</td>
<td>Rakka</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1736</td>
<td>Okçu İzzeddinli</td>
<td>Kilis- Kafir Dağı</td>
<td>Kilis-Rakka</td>
<td>Banditry</td>
</tr>
<tr>
<td>1737</td>
<td>Musacalu, Şereflı ve Milli</td>
<td>Muhtelif yerler</td>
<td>Rakka</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1737</td>
<td>Okçu İzzedinli</td>
<td>Kilis</td>
<td>Rakka</td>
<td>The Safety of Pilgrimage</td>
</tr>
<tr>
<td>1738</td>
<td>İmam Kulu Bahadırılı, Kul Uşakları</td>
<td>Sivas- Halep</td>
<td>Rakka</td>
<td>For Not Paying Their Taxes</td>
</tr>
<tr>
<td>1738</td>
<td>Köçekli- Salur</td>
<td>Adana</td>
<td>Rakka</td>
<td>Banditry</td>
</tr>
<tr>
<td>1738</td>
<td>Kayseri Lekvan, Bektaşlı</td>
<td>Kayseri</td>
<td>Rakka</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1739</td>
<td>Siverek</td>
<td>Bucak aşireti</td>
<td>Siverek</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1740</td>
<td>İmranlı</td>
<td>Malatya</td>
<td>Rakka</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1742</td>
<td>Recepli Afşarı</td>
<td>Adana</td>
<td>Rakka</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1742</td>
<td>Cihanbeğli- İmranlı</td>
<td>Darende</td>
<td>Rakka</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1742</td>
<td>-</td>
<td>Beğdili</td>
<td>Rakka</td>
<td>Re-Settlement of Fugitives</td>
</tr>
<tr>
<td>1743</td>
<td>Tacirli</td>
<td>Tarsus</td>
<td>Rakka</td>
<td>Opposition to Settlement (1153)</td>
</tr>
</tbody>
</table>


As it can be seen from above diagram, it is possible to evaluate the settlement policies of Ahmed Pasha in two steps. First one of these is the re-settlement of fugitive tribes who were settled by governorate before. The other one is that the tribes of Kafir Mountain and Çukurova were subjected to settlement where Pasha went for discipline campaign.
It is possible to evaluate Raqqa settlements as internal and external settlements generally. While one of these settlement initiatives, external settlements, were unsuccessful as it can be seen from above diagram, the initiatives of internal settlements succeeded. The reason of this was that tribes in Raqqa province did not have compliance problem. Baziki tribe from Bozabad, Berazi tribe from Suruç, Milli tribe from the north of Colab river, and Barak tribes from Nizib subprovince were put to settlement for the purpose of their permanent settlement within the scope of internal settlement in 1735. The all of mentioned tribes were the tribes of Raqqa province. This condition was the indicator that internal settlement was more important in the settlement policy of Ahmed Pasha period. The subject of tribes in internal settlement were allowed to use their traditional relations of productions and to send their shepherds to plateaus. Hence, the increase of cereal production and the increase of labor efficiency were aimed with this policy. Tribes were allowed to go plateaus if they would pay their taxes regularly in order tribes to continue husbandry which was their autochthonous relations of productions (BOA, A.DVN. MHM.d.142, s.248).

The practices of settlement policies were not based on the abandoning of husbandry, which was the basic relations of productions of tribes and based upon nomadic life. The settlement of Bahadırlı, Kul Uşağı and İmam Uşağı tribes to Raqqa was requested with sent command to Ahmed Pasha in 1738 since they did not pay their tax debts. Formerly, they were registered into the mukataas of Haremeyn waqf. Moreover, it was demanded from pasha for the allowance of these tribes to go plateaus after settlement process (BOA, A.DVN. MHM.d.145, 1738:232). As it can be seen from this example, the settlement policy was determined according to the desires of tribes to abandon or not husbandry based upon nomadic life and their contributions to production and financial structure.

The demands of the actualization of external settlements from Ahmet Pasha were began to be intensive. The reason of settlement demands was the public order problems in provinces since governors of various provinces were in the campaigns. Ex post public order problems in 1737 and 38 caused the interruption of the connection of pilgrimage between Payas-Halep. Since it was an important prestige issue for state, state requested from Ahmed Pasha to open the pilgrimage road, to winter over Kayseri, and to organize a discipline campaign to Kayseri in 1738. Some nomadic tribes in Kayseri were commanded to settle in Raqqa by state also. If he became successful to bring tribes from Kayseri to Raqqa, these would be registered to Raqqa treasury as mukataas. This situation reflected different approaches for the settled tribes for discipline whether they should be subjected to tax exemption or they should be subjected to taxation after a transition process (BOA, A.DVN. MHM.d.145, 1738:234).

Ahmed Pasha was inducted to Erzurum as serasker in 1742. The task of re-settlement of Recepli Aṣars, who were the fugitives of Raqqa settlement, was given to Adana governor since pasha was not in his province because of his duty in Erzurum as serasker. The reason to give this
task to Adana governor was that Afşars had already been in Adana every summer since they had their winter quarters in Çukurova (BOA, A.DVN. MHM.d.148. p.255).

In order to provide the integration of Raqqa tribes who were subjected into internal settlement into both financial and production process and to increase their activities from their administration, a tribal clerk was selected among them. Tribal clerks were subjected into tripartite classification according to the criterion of the base of their ethnics as the groups of Arabi(Arab), Etraki(Turkish), and Ekradi(Kurdish). The payments to tribal clerks in the expenditures of Raqqa treasury were the indicator that they were employeed as civil servant. The contributions of the tribes who were subjected into internal settlement to financial system in Ahmed Pasha period became visible unlike other tribes before. The contributions of them to Raqqa treasury were occurred as 20.000 guruş from Berazi tribe, 66 guruş from Beni Nif tribe and 4270 guruş from Sair tribes annually in 1733 (Öğüt, 2013:154).

The Purchase and Delivery Organization of Provisions

Raqqa province had wide and fertile plateaus such as Suruç, Birecik, Baziki and Harran. Another sanjak of Raqqa province, Birecik, was placed in the riverside of Euphrates like Ruha (Urfa). Therefore, Birecik was a natural and logistic base for supplying provisions and ammunition needs of Baghdad and Basra in Persian campaign period. Birecik could supply the %25 needs of Baghdad and Basra with the provision delivery (Murphey, 2007:111).

The importance of Raqqa province and Birecik pier for the delivery of provisions originated for the security of roads and the high prices of delivery. For instance, one kantar (56.5 kilos) wheat was 10 or 20 guruş in Halep at the beginning of 18th century. The payment of provision delivery from Halep to Baghdad was twice as much as the value of goods. Furthermore, the security of roads was uncertain since it was left to Mevali Tribe’s mercy (Masters, 1988: 119).

The sanjak of Birecik was not only important for its pier to deliver provision supply but also it had Barak and Suruç plateaus in its borders for agricultural production. Although Baghdad and Basra were priority region for provision supply through this sanjak, the provision delivery of Birecik was not limited with only them. For instance, it was requested from Ahmed Pasha to supply the provision needs of Halep from Birecik since agricultural activities were interrupted as a result of public order problems (B OA, A.DVN. MHM.d.147. s.287).

An important obligation of Raqqa governors for campaigns was to hold provision stocks to be prepared at any moment. In fact, it was requested from Maraş and Diyarbekir governors and Ahmed Pasha to prepare provision stocks for soldiers in Revan and Gence. However, the stock of provisions could be problematic occasionally because there were no pre-prepared depots. For example, 130.000 kile (bushel-36.5 kg) barleys purchased with the skill of mubayaca (purchaser) Murtaza Efendi at Urfa in 1741 but they were stocked in Sebilhane (buildings where
water needs provided and water distributed) buildings instead of a depot since there was no state depot in Urfa. However, Ahmed Pasha reported that barleys were wasted by mice. Under these circumstances, the loss of provisions would be compensated by re-distributing it to the reaya (people) of Raqqa province. Thereafter, it would be retrieved with new purchase in order (BOA, D.MKF, 1236/68). Thus, the taxpayers of Raqqa exposed with a new tax burden because of the problems of stock conditions.

Mubayacs (purchasers) from senior accounting office were charged to purchase provisions. The reason for this condition was to prevent abuses since provincial treasury would be used in purchases. Murtaza Efendi was charged for the purchases at Raqqa in 1742. Murtaza Efendi was put the amount of barleys through the distribution among sanjaks because the provision purchase to the state was an administrative responsibility for villagers. The purchases from Birecik were 11,760 kiles, the purchases from Rumkale were 3,360 kilo and the rest was taken from Urfa with distributive operation of Murtaza Efendi between Birecik, Rumkale, and Urfa. The payment of barley purchases was determined as 30 sağ (right) akçe. The reason to use “sağ” term in akçe (Ottoman currency) was the initiative of standardization of monetary system all over the Ottoman realm with monetary reform in Sultan Mahmud I period (BOA, D.MKF, 1239/100). The provision purchases of Mardin made with 30 akçe as well in 1742 like the purchase price of Urfa (BOA, D.BŞM, 3433/83).

Provision organization was not limited with mubayaa operation (purchase), it also involved with avarız taxes (extraordinary taxes in Ottoman Empire). Avarız taxes were also contained nüzul (taxes to support army) and sürsat (obligation for public to provide food to army) taxes. The collection of avarız was made through taxpayers called as “avarız hanesi” in cash or maktu (payment in kind). Avarız hanes were determined according to the criterion of taxpayers’ ability to pay based upon cadastral record books of avarız. Therefore, avarız hanes did not base on a standard unit and differentiated for each province’s economic condition. The revenues of avarız collections were recorded in the treasury revenues of provinces which reaya were registered. They were recorded to the books of senior accounting office as well since senior accounting office could track them. Because avarız was a fixed tax, it was collected by public collectors without mültezims. However, the avarız taxes of Rumkale were collected with iltizam system (tax contractorship) subjected to mukataa of Rumkale. However, this situation caused a dualist practice in avarız collection in Raqqa province. Hence, the operation of avarız and nüzul in Rumkale was transferred into the revenues of Raqqa treasury from muhasıllık of Halep at Tezkire-i Evvel Katibi (First Clerk) Abdi Efendi’s request. While the number of avarız hanes in Raqqa province was 200, the numbers of Rumkale was nothing more than 20 in 1742 when the avarız hanes of Rumkale were transferred into Raqqa treasury. While the avarız collection of Raqqa was 2762 guruş in the same year, the avarız collection of Rumkale was only 183 guruş 14 akçe. (BOA, D.MKF, 1227/99).
The contributions of tribes to financial system were not limited with tax revenues only. They were also obligated to pay extraordinary taxes, which were collected as provision price, in war times. 4290 guruş was collected from tribes as provision price at Birecik sanjak of Raqqa province in 1733. Moreover, 502 guruş was collected as well for the payment of mübaşir (usher) from tribes other than provision price (Öğüt, 2013: 156).

The contributions of Raqqa tribes in provision organization sometimes went out of the borders of province. For instance, Raqqa governor Rızvan Ahmed Pasha were assigned for provision purchase and the transportation of provisions from Mosul in 1733 when he was in Mosul front. Ahmed Pasha supplied the payments of the rents of 485 camels of 1,500 units from the tribes of Ruha and Birecik for provision transportation and he paid 75 guruş for each camel to tribes in return of transportation fee (BOA, 1733: A.DVN.MHM 139:281). However, the transformation fee to camels was actually reciprocity for a long-term plan of renting operation because 420 akçe (one guruş was 120 akçe in this period) were paid in total for provision transportation from Mardin to Mosul and this operation was restricted with 8 kile (204.5 kilos) load limit per camel (BOA, D.BŞM, 3433/83).

Shipyard Organization

Shipyards were a complementary field of activity to provision organizations. In this context, provision and shipyard organization can be evaluated as follows;

- Transportation from cereal production areas to Birecik pier,
- The transportation of provision to Rızvaniye pier near to Baghdad with built ships in this shipyard,
- Providing road security for provision transportation in river.

The activity of Birecik shipyard under the domination of Ottomans started with building a boat in 1552 and it was completed with building 150 ships in 1777 in the end. This shipyard was used in 17 operational period in this time period and the sum of 1973 tools from boats to ships were produced in this shipyard as well. The number of produced ships was 546 in 5 operational periods of Sultan Mahmud I period (Öğüt, 2013:250). Moreover, Birecik was a logistic base for the transportation of timbers from Malatya and especially Maraş mountains to Basra fleet. For instance, 20,000 timbers were transported to Basra through Birecik in 1730. The active periods of shipyard was limited with military purposes and it did not contribute to civil transportation. The most important reason for this situation was the high costs of timber supply in Birecik. For example, while the cost of each winged frigate ship produced in Birecik was 1771 guruş, the cost of them was 1255 guruş in İstanbul in 1730 (Öğüt, 2013: 253). Despite indicated negativities, Birecik shipyard and pier was the natural supply base of Basra shipyard. However, Ottoman Empire did not benefit this condition with mercantilist approach.
The finance of built ships in Birecik was provided from Halep treasury until 1701. The finance of shipyard was provided from muhasıllık of Halep until 1726 because Halep treasury turned into a muhasıllık in 1701. After 1726, it was provided from both muhasıllık of Halep and Raqqa treasury jointly. The price of contribution to expenditures of shipyard between Halep treasury and Raqqa treasury was determined by tersane-i amire (chief of shipyard) before every operational period (Öğüt, 2013:250).

120 ships were built in 1733-34 operational period in Ahmed Pasha period. 28.830 piece of timbers from Maraş, Antep and Rumkale were used for this building operation. The building budget of ships was 35.000 guruş. The contribution of Raqqa treasury to shipyard budget was 10.000 guruş. The rest of it was consisted of 15.000 guruş transfer from muhasıllık of Halep and 10.000 guruş from ordu defterdalığı (provincial treasury of army) with the directive of hazine-yi amire (head of treasury) (Öğüt, 2013:277).

Although shipyard received orders to build 300 ships in the operational period of 1735-36, 120 ships barely finished because of difficulties of timber supply. 36.000 kile (921.600 kg) provisions dispatched to Rızvaniye pier by loading 300 kile to every ship from Birecik. The tasking of cavalries for the protection of ships from over-land was requested from Ahmed Pasha. The protection of ships would be from Birecik to Deyr and after this position, the protection task would be handed over to Mevali tribe from Halep. Ahmed Pasha stationed Ben-i Kaysı tribe from Urfa for the protection of ships (BOA, A.DVN. MHM.d. 151, s. 54).

128 ships were built in Birecik shipyard in the same period. Reşi tribe was successful to supply shipyard in return for requested oak coals in market prices. The economic gain of Reşi tribe was not limited with the yields of oak coals. This tribe was freed from every kind of taxes and their military missions thanks to their success in delivery (BOA, 1733: A.DVN.MHM 140:198).

The Removal of Ahmed Pasha

After his mission as the guardian of Kars, Ahmed Pasha was removed from his position and the state confiscated his property at Raqqa in 1745. Pasha subjected to “cezirebent” punishment which meant compulsory settlement on an island and was a widespread type of punishment after removals in Ottoman Empire. His cezirebent place was Rhodes island. The process of pasha’s removal originated from his groom, mütesellim (deputy-governor) of Raqqa Süleyman Efendi, impose illegal taxes which were called “tekalif-i şakka” when Ahmed Pasha was in his mission as serasker of Erzurum and the practices of his sons, Abdurrahman and Ömer Efendis, in the mukataa and malikane of Kilis-Azzaz which they had operated.

The practices of tekalif-i şakka was a financial crime that state officials committed after the transfer of governor hasses into the account of treasury in 18th century (Cezar, 1989:45). Ottoman taxpayers took action against new tax demands because they knew financial obligations
which were embodied in sanjak decrees and became constant in time. State always held open the top administrative unit, Divan-ı Hümayun, without looking out for any lineage for its contribution to ease supervision.

The subject of claims of interest against the mütesellim of Raqqa, Süleyman, and his treasurer Selim was the tekalif-i şakka practices. The equivalent of tekalif-i şakka practices reached 1200 kise (1 kise was 50,000 akçe), in other words, 500,000 guruş. The sons of Ahmed Pasha, Abdurrahman and Ömer, bought Kiliz-Azzaz mukataa with 29,000 muaccele (tender cash price) price as malikane for the reason of the contribution of Okçu İzzendili tribe’s discipline. However, incoming claims were about the intensive usage of tekalif-i şakka practices in this region as well. Another subject of claim was the taxation of Mevali tribe who was freed from any civil taxes in return for the security of Halep region and around of it.

When Ahmed Pasha arrived Raqqa, it was requested to pay compensations in order to resolve complains aggrieved parties from Urfa and Kilis. However, demanded prices were quite above levels than pasha could pay. When Ahmed Pasha was removed because he could not pay compensations, the amount of his assets from müsadere (confiscation) was 101,107 guruş. The important part of his assets in müsadere was consisted of a wide weapon collection (such as Circassian axe, Persian bow) rather than monetary assets.

Müsadere (confiscation) was a practice to remove Ottoman state officials for reasons such as ineffectualness or professional misconduct and following this process, to seize their assets by state. The assets of state officials subjected to müasadere in their deaths as well. The legal basis of this practice which limited the law of inheritance of state officials was that they were in the class of “kul taifesı”. The practices of müsadere were applied frequently after the defeat in Siege of Vienna in 1683 and important contributions provided to treasury. The highest müsadere operation of 18th century was the müsadere of Raqqa Governor Pir Mustafa Pasha. The price of müsadere from Pir Mustafa Pasha was 50,000 kise (Tabakoğlu, 1985:298). This condition had a mechanism to seize the accumulation of a class which could make savings to create funds for the state. However, the practices of müsadere were based on constant removals and objective motives by respecting legality.

The most important monetary accumulation of Pasha was 20,000 guruş for a business partnership with a merchant from Halep (Öğüt- Küçük, 2015:32-47).

The unregistered wealth of Ali Pasha, who passed on while serving in Raqqa as governor before Ahmed Pasha, in the müsadere of Urfa arised in 1742 with the warning of his payee, Ali. Ali Pasha had 70,000 gold coins and 130 woolen silk from Koçzade Hüseyin efendi who was a merchant in Urfa BOA, A.DVN. MHM. d.150, s. 179.
Padishah gave a chance to Ahmed Pasha because he was a successful soldier after the decision of his removal. The subjects of claims from Pasha was the compensation of financial crimes. If Ahmed Pasha could pay compensations, he would be inducted to Adana governorate. However, he could not afford to pay the demanded compensations, it would be adjourned as the continuation of his removal in service.

**Conclusion**

The greatest political success of Ottoman Empire in 18th century was to become victorious against her significant rivals, Austria, Iran, and Russia, at different three fronts in the period of Sultan Mahmud I. The reasons of being victorious in the wars were a well-organized war economy and successful financial organization. The administrative and financial organization of these wars became possible thanks to the analytical evaluations through one of the important logistic bases in Persian wars, Raqqa. The administrative and financial organization on a province was actualized that the burden of war finance apportioned between provinces on the basis of sustainability. In this regard, social structure, which was specific to tribes, was placed within the spiral of this organization. The success in wars was based on the financial management within the frame of the base of sustainability. As for the financial exploitation of the state, it was limited with the accumulations of state officials. Meanwhile, the subject of this study’s period corresponded to the dawn of industrial revolution. This period corresponded to the reign of Sultan Mahmud I and both merchants and state officials had no problem for capital accumulation in this period in Ottoman Empire. However, saving problems occurred from transfer as well rather than accumulation. It was defined that an active business management was in existence in Ottoman Empire but this accumulation was held in state monopoly as well as it can be seen the examples of Birecik shipyard and provision organization.
References

Published Works

Acemoğlu, Daron ve Robinson, James, 2013, Ulusların Düşüşü, Çeviren; Faruk Rasim Velioğlu, Doğan Kitap, İstanbul

Akdağ, Mustafa, 1994 Türk Halkının Dirlik ve Düzenlik Kavgası- Celali İyianları, Cem Yayınları, İstanbul

Barkan, Ömer Lütfi, 2000, Osmanlı İmparatorluğu’nda Bir İskan ve Kolonizasyon Metodu Olarak sürgünler- II”, Osmanlı Devletinin Sosyal ve Ekonomik Tarihi, Cilt: 1, Yayına Hazırlayan; Hüseyin Özdeğer, İstanbul Üniversitesi Yayınları, İstanbul


Cezar, Yavuz, 1989, Osmanlı Maliyesinde Bunalım ve Değişim, Alan Yayınları, İstanbul

Çakır, Baki, 2003, Osmanlı Mukataa Sistemi, Kitabevi, İstanbul


Murhey, Rhodas, 2007, Osmanlı’da Ordu ve Savaş(1500-1700), Çeviren; M. Tanju Akad, Homer Kitap, İstanbul

Öğüt, Tahir, 2013, 18.-19. YY’da Birecik Sancağında İktisadi ve Sosyal Yapı, TTK, Ankara

Öğüt, Tahir ve Küçük, Nihat, 2015, 18. Yüzyılda Kılış’ta Okçu İzzeddinli Aşiretinin Vergi Direnci, AKAD, P-ISSN 1309-3792, Mayıs Sayısı, Kilis

Özkaya, Yücel, 1985, XVIII. Yüzyılda Osmanlı Kurumları ve Osmanlı Toplum Yaşantısı, Kültür Bakanlığı Yayınları, Ankara

Özvar, Erol, 2003 Osmanlı Maliyesinde Malikane Uygulamaları, Kitabevi, İstanbul

Tabakoğlu, Ahmet, 2012, Türkiye İktisat Tarihi, Dergah Yayınları, İstanbul

Uzunçarşılı, İsmail Hakkı, 1995, Osmanlı Tarihi, Cilt; IV, TTK, Ankara
Archival Resources

(Başkanlık Osmanlı Arşivi Mühimme Defterleri)

BOA, A.DVN. MHM.d.139
BOA, A.DVN. MHM.d.140
BOA, A.DVN. MHM.d.141
BOA, A.DVN. MHM.d.142
BOA, A.DVN. MHM.d.143
BOA, A.DVN. MHM.d.144
BOA, A.DVN. MHM.d.145
BOA, A.DVN. MHM.d.146
BOA, A.DVN. MHM.d.147
BOA, A.DVN. MHM.d.148
BOA, A.DVN. MHM.d.149
BOA, A.DVN. MHM.d.150
BOA, A.DVN. MHM.d.151
PART IV

TAX LAW and THEORY
Introduction
The emergence of derivative financial instruments such as forward, futures, swaps and option contracts is based mainly on the purpose of hedging investors against varying economic conditions. Risks involving interest rates, prices, and exchange rates have emerged in international markets due to economic crises encountered throughout the years. In order to hedge risks, investors may trade futures contracts for buying or selling any commodities and financial instruments to be delivered at a further date. In time, the functionality of the derivatives markets and full comprehension of the risks by the investors have contributed to the development of derivative financial instruments. It is important to determine whether – and if so, to what extent – the transactions made in these markets subject to taxation. Within the scope of this study, the positive value emerging from derivative markets is to be examined concerning income, value-added, banking and insurance transactions, stamp duty and corporate taxation.

Basic Concepts Regarding Derivative Financial Instruments
The financial markets were established with the main objective of bringing the market actors (who are either the suppliers or the demanders of funds) together. The main actors in these markets consist of households, public/private sectors, and international investors. It is possible to categorize financial markets in different ways. In accordance with the type of transaction, the markets can be classified as either spot or futures (derivatives) markets. Most commonly, payments occur at the time of delivery in spot markets. For instance, when the shares of stock are purchased, the market price is paid as soon as the shares are delivered (Saltoglu, 2016: 9). Futures market instruments are derivatives directly indexed to the value of another financial asset or commodity. The main task of the derivative market instruments involves hedging the investors against any risks that may arise in the financial market and preserving the investors’ profits (Ozer, 2013: 2). In general, derivative financial instruments are financial contracts being traded between two parties for the aim of buying and selling today contingent on the future
value of one or more predetermined assets. Derivative financial markets, however, are the ones in which those contracts, i.e. derivative instruments, are traded. In other words, they are such markets that any commodity or financial instrument for which delivery or cash settlement is to be made at a later date are traded on the day of purchase or sale. Futures contracts are made between buyer and seller parties which regulate the exchange of a standard amount and quality of an asset in consideration of the payment of a predetermined price on a specific date in the future (Ersoy, 2011: 66).

Financial instruments developed based on spot markets are called derivative instruments. Financial instruments upon which the derivative instruments’ prices are based are called underlying assets (Yılmaz and Aslan, 2016: 664). The performance of derivative instruments is contingent upon the value assigned to their underlying asset during the contract. Payments at these markets occur at a forward date depending on the terms of the contracts. Derivative contracts are also comprised of a buyer and a seller as well as in spot markets. Cash payments may not usually be made during the transaction, but depending on the situation, it may be necessary to pay a certain deposit (Saltoglu, 2016: 9).

A Brief History Of Derivative Financial Instruments

In ancient Greece, the famous mathematician Thales (624-546 B.C.) was said to have provided successful yield and price estimates using precipitation and climate models. It is reported that in the ancient city of Milet in the Aegean region, he reputedly made successful estimations on olive prices and conducted futures transactions on the item. More recently, it is known that the first trading of rough rice futures contracts took place in Dojima, Japan (Saltoglu, 2016: 12). Nonetheless, the first organized futures exchange market for buying and selling of wheat and corn was established in Chicago in 1848. The use of forward contracts in order to speculate on the cash market and to hedge risks regarding price fluctuations arising due to the American Civil War had become popular very rapidly. Hereupon, the Chicago Board of Trade (CBOT) took the first step in the establishment of modern futures markets by introducing standard rules in 1865. Following that circumstance, futures transactions began to take place at the New York Cotton Stock Exchange in 1872 (Hacıoğlu Deniz, Özcelebi, & Haykır Hobikoglu, 2011: 169).

Derivative Financial Markets

The derivative financial instruments are financial securities with values dependent upon the values of other financial assets from which the former are derived. Derivative financial instruments may be utilized for either hedging against risks or replacement of instruments such as floating rate bonds with fixed-rate bonds. Transactions in derivative markets include forward, futures,
options, and swap operations. The common feature of these transactions is the purchase and sale of any goods or financial assets to be delivered on a further date (Kaptanoglu, 2015: 3).

Derivative instruments offer different alternatives to all market participants, especially in the area of risk management. These products enable the transfer of financial risks for many companies in an appropriate way. Derivative markets are the part of economic activities that create jobs in many countries. According to the results of a research conducted, more than 80% of the private firms in the USA are detected to utilize derivative instruments to help them implementing financial policies in 1994.

While the use of derivative instruments contributes to stability by increasing the extent of financial deepening of markets at the macro level, it also provides the opportunity to normalize the risks arising from future uncertainty at the corporate level. Derivative instruments harbor various risks, whereas their usage by the companies as the means of reducing the uncertainties in the markets, making effective planning and forecasting, and minimizing surprises have increased rapidly. In recent years, the losses incurred by some large-scale industrial companies, commercial firms, financial institutions, and local governments in derivative markets have proven that even professional investors may not be able to utilize derivative markets too carefully, may not choose appropriate strategies and therefore face major losses unless they adopt an effective internal control mechanism (Kaygusuzoglu, 2011: 138-139).

**Types Of Derivative Market Transactions**

In general, derivative instruments are financial contracts being traded between two parties for the purpose of buying and selling today depending on the future value of one or more predetermined assets. Derivative financial markets are the ones through which those contracts, i.e., derivative products, are being traded. In other words, any commodities or financial instruments for which delivery or cash settlement is to be made at a later date are being traded on the day of purchase or sale. Futures contracts are the ones made between buyer and seller parties which regulate the purchase and sale of standard amounts and qualities of assets at predetermined prices on specific future dates (Ersoy, 2011: 64).

**Forward contracts**

Forward contracts are the ones that establish the obligation for the buyer to purchase a financial asset such as foreign exchange, interest, commodities, etc. at a predetermined price on a future date as well as the obligation for the other party to sell the related asset at the specified price on the future date. The whole detail of the contract including the characteristics of the financial asset, the dates of delivery and payment, the place of delivery, the methods of delivery
and payment, the quantity and the price are freely determined in accordance with the needs of the parties as a result of the negotiations between all the parties concerned (Kutuk, 2014:4).

Forward market transactions possess two important features, one of which is being involved in a forward date, and the other one is being binding for both counterparties. The main objective of forward market transactions is to minimize the risk of unexpected fluctuations in the prices of various assets that are subject to purchase and sale (Kaygusuzoglu, 2011: 140).

**Futures contracts**

Futures contracts are derivative instruments originally developed to protect producers and merchants against fluctuations in the prices of commodities. The Chicago Board of Trade (CBOT), as the first futures exchange, was established in Chicago, United States. The futures transactions that were mainly comprised of agricultural products such as wheat, cotton, soybean oil in the past are now being predominantly conducted on financial assets such as petroleum, various borrowing instruments, foreign exchange and stock indexes (Nurcan, 2005: 15).

In 1865, the General Terms and Conditions of the CBOT were amended to standardize the terms of the contractual assets and the terms of the forward contracts, such as the properties, quantity, value and delivery methods of these assets. Futures contracts are seen to be drawn up on bonds, stock market indices, electricity, bank deposit accounts and stocks in the 1990s, whereas they were made on agricultural products and natural resources until the 1970s (Kurar, 2010: 30).

Futures contracts are also available for agricultural products, natural resources, foreign currencies, fixed rate debt instruments and stock market indices. Futures contracts are legally binding and enforceable promises that include a commitment to deliver or receive an asset or commodity of a certain standard on a future date at a fixed price predetermined on the date of the contract. There are two parties to the contract. The selling party is the holder of the short position while the buying party holds the long position. The very essence of a future contract rests on a determination of the price at which the transaction would take place on a specified future date as agreed by both parties (Batı, 2012: 35).

**Options contracts**

The term “option” was derived from the Latin word *optio*, meaning “free choice” or “free will.” As the word implies, options include the right to choose, unlike other derivatives. In options, the contractual right arising from the contract would be exercised by the option holder as long as the conditions are met. An option is a contract that gives a party the right to sell or purchase a financial asset at a predetermined price in exchange for a specified premium over a
future date or within a specified period. An option is a forfeitable futures transaction for the buyer which involves the purchase and sale of certain or standard quantities and qualities of goods or other derivative goods, such as money, gold, etc. at a predetermined price on an organized or non-organized market on a future date. Options contracts represent a right of the buyer (holder), and an obligation for the seller (writer). Buyers and sellers are entitled to be paid an amount of premium in order to offset the risk they assume in return for their right to buy and obligation to sell, respectively. In short, the premium corresponds to the cost of the price risk assumed by the option sellers which is paid in advance (Yılmaz and Aslan, 2016: 667).

Along with the establishment of the Chicago Board Options Exchange on April 26, 1973, options contracts have begun to be traded in an organized market for the first time. Following the developments in America, the first options exchange in Europe was established in Amsterdam in 1978, namely, the European Options Exchange. In the same year, the London Options Exchange has also been active in the United Kingdom. Throughout the 1980s, options exchanges started to operate in Japan, Australia and Singapore besides Europe and America (Kutuk, 2014: 18).

**Swap contracts**

A swap contract is a derivative instrument established in order for two parties to exchange cash flows of either party’s financial instrument for those of the other’s.

For instance, in the interest rate swap contract, when one party pays a fixed interest to the counterparty for a certain period, the counterparty receives interest payments that vary according to market conditions during the same period. Cash flows are calculated on a principal amount determined in the contract. A fixed interest determined at the beginning of the contract is paid to the other party on a certain principal by installments. On the other hand, floating interest payments are collected in return. Floating interest payments are obtained by different interest rates that would occur in the future periods on the same principal. The investor pays only the fixed interest to the counterparty, and hence, the counterparty collects the floating interest payment for each period. Swap contracts, in fact, allow a single settlement to provide the exchange of cash flows in different terms within specific conditions. In swap markets, transactions are mostly carried out through an intermediary institution since the direct confrontation between the buyer and the seller would be impractical (Saltoglu, 2016: 23).

Historically, the first swap contract was introduced in the 16\textsuperscript{th} century by the Genoese Bankers through the money market in Antwerp where Spain sold silver to Genoese merchants in exchange for future delivery of gold. Swap contracts, which later formed a link between cash and forward currency markets in the 20\textsuperscript{th} century, were first realized in 1923 by the Austrian National Bank, which sold and repurchased the national currency in exchange for the British
sterling on the cash market. However, the actual improvement in swap contracts has been observed after the 1970s. The currency swap technique has been originally developed throughout the 1960s by the arbitrageurs in the United Kingdom who wanted to cope with the government’s exchange intervention. In 1981, the World Bank entered into a major currency swap agreement with the IBM Corporation. After this development, the use of swap contracts became widespread in the world (Avsar, 2004: 33).

**Taxation in Derivate Markets**

**In terms of the income tax**

The revenues derived from option transactions that are traded on forward, swap and over-the-counter markets are not considered as securities of the contracts, and therefore, they are regarded as gains from trade “resulting from the purchase and sale of securities on their behalf and accounts” according to Article 37 of the Income Tax Law No. 193.

In case, such revenues are acquired in a commercial organization as a private company or institution, and the continuity and intent are found in the transactions carried out, the obtained revenue is considered as gains from trade. In the event that these conditions are not fulfilled, the gains are not considered as returns on stocks or bonds in accordance with Temporary Article 76 of the Income Tax Law (Akcakın, 2015).

In Article 75 of the Income Tax Law, the return on capital is defined as “profit share, interest, and rent revenues obtained by the owner from other than commercial, agricultural or professional activities consisting of values represented with cash capital or money.” In this context, since options contracts that are not traded in forward, swap and over-the-counter markets are not described as securities, the revenue from these transactions cannot be regarded as the return on capital. Since futures and options contracts traded on organized markets are considered as securities, the proceeds from these transactions are regarded as the returns on capital (Kaptanoglu, 2015: 59-60).

**In terms of the value-added tax (vat)**

According to Article 10 of the Value-Added Tax Law, what gives rise to tax on derivative transactions is the delivery of the goods on the date determined in the contract or the issuance of invoices or similar documents prior to the delivery of the goods. According to Article 20 of Value-Added Tax Law, the tax base represents “the total of benefits, services, and values regarding money which are received or borrowed in any way from the persons who receive the delivery of the goods or services” (Arslan, 2017: 46).

According to Clause 4(g) of Article 17 entitled “Social and Military Exceptions and Other Exceptions” of the Value-Added Tax Law; “Delivery of gold and silver bullions, imports of precious
stones (diamond, ruby, emerald, topaz, sapphire, chrysolite, pearl) to be traded on a stock exchange established in Turkey, foreign exchange, money, stamp duty, valuable papers, stocks, bonds, asset lease issued by companies, lease certificates, capital market instruments traded on a stock exchange established in Turkey, and delivery of metal, plastic, rubber, paper, glass scrap and wastes” are exempted from value-added tax. In this circumstance, the gains to be obtained through derivative financial instruments are exempted from the VAT.

In terms of the stamp tax
The stamp tax involves the papers written on Table No.1 annexed to the Stamp Tax Law No. 488. Those who sign the papers mentioned in Table No. 1 according to Article 3 of the Law are the stamp taxpayers. Futures contracts, as the name implies, are legal contracts. There are also “papers pertaining to the contracts” among the papers subject to tax written on Tablo No. 1 annexed to the Stamp Tax Law. For this reason, futures contracts are subject to stamp tax. However, the Stamp Tax Law provides an exception clause on futures contracts. A clause No.19 entitled “IV- Papers Relating to Commercial and Civil Works” of the Table No. 2 attached to the Stamp Tax Law No.488 in addition to the other existing exceptions to the stamp tax along with Article 6 of the "Law Amending Some Laws" No. 4761 which has been published in the Official Gazette numbered 24793 on June 22nd, 2002. In this context, the clause No. 19 states that “option and futures contracts which bear the right/liability to purchase, sell or exchange money, capital market instruments, commodities, precious metals and foreign exchanges on the basis of predetermined terms over the stated price, amount and quality among the banks or where the banks are parties of relevant transactions” are exempted from stamp tax. Futures and options contracts in the aforementioned clause cover all forward, futures, swap and option contracts. Accordingly, futures contracts that are made only between banks, by banks, or through banks are exempt from stamp tax (Avsar, 2004: 142-143). Since derivative contracts are considered within the context of a contract that includes a certain amount of money or commitment, guarantee or confirmation, derivative contracts to which banks do not become parties are subject to the relative stamp tax rate of 9.48 ‰ in the scope of the Stamp Tax Law (Kaptanoglu, 2015: 64).

In terms of the corporate income tax
The amount of corporate tax is calculated on the net revenue earned by taxpayers within an accounting period. The provisions of the Income Tax Law on “gains from trade” are applied in the determination of the net corporate revenue. Revenues derived from derivative transactions carried out by companies and institutions are taxed on the accrual basis as included in the net corporate revenue without any limitation.
Since non-resident corporations being subject to corporate tax whose legal business centers and headquarters reside outside Turkey are considered limited tax liable according to Article 22(2) of the Corporate Income Tax Law; “Provisions of the Income Tax Law concerning the determination of such gains and revenues other than commercial or agricultural income generated by the limited tax liable taxpayers shall apply. However, if those gains are generated in the context of commercial or agricultural activities conducted in Turkey, corporate income is determined in accordance with Article 22(1)”.

Within the scope of the provision of the Temporary Article 67(1) of the Income Tax Law, “banks and intermediary institutions apply 15% tax withholding over their incomes as follows:

a) The difference between the purchase and sale prices of the securities intermediated for trading and of other capital market instruments,

b) the difference between the purchase price and the redemption value the securities intermediated for trading in the event of the redemption of those securities or other capital market instruments,

c) the periodical returns (not related to any securities or other capital market instrument) that are collected via intermediation of securities or other capital market instruments,

d) Income derived from the lending of securities or other capital market instruments for which they act as intermediaries” (Azak, 2015).

**In terms of the banking and insurance transactions tax (bitt)**

According to Article 5 of the Law No. 4761; “The Council of Ministers is authorized to revise or reduce the tax rates stated in this article for the interbank deposit transactions, the stock exchange and money market transactions among the intermediary institutions established with the Capital Market Law No. 2499, and other bank and insurance transactions as well as exchange rate transactions down to 1% and 0%, respectively”. Derivative transactions except for foreign exchange transaction are subject to 5% BITT over the amount of earnings. In the case of banks trading in futures markets through intermediary institutions, the earnings are subject to 1% BITT. Article 29(p) entitled “Exceptions” of the Transaction Tax Law No. 6802; is amended as “Arbitrage transactions along with transactions related to futures and options contracts realized in a stock exchange established in Turkey and monies received are in favor of this treatment as a result”. The arbitrage transactions as of 09.01.2010 and the transactions and gains of futures contracts and options contracts that are traded only on “Borsa İstanbul A.Ş.” (BIST) are exempt from BITT (Dogan, 2015: 31).
Conclusion

Derivative instruments that were brought forth for hedging financial risks have become acceptable investment instruments all over the world after a while. Since investors are particularly vulnerable to momentary fluctuations in the markets, they tend to edge toward the derivative markets regarded as futures markets. Governments also began to aim at taxation of revenues yielded from derivative market instruments such as futures, futures, options and swap contracts within the legal boundaries. The taxation of derivative instruments in Turkey, especially in respect of income, value added, stamp duty, corporate and banks and insurance transactions tax is explicated. The aspects in which the circumstances of revenues earned through those derivative financial instruments differ can be summarized as follows.

In terms of the income tax, the revenues earned from options contract transactions traded on either forward, swap or over-the-counter markets are considered as gains from trade. However, futures and options contracts traded on organized markets are subject to income tax since they are considered as returns on capital.

In terms of the value-added tax, the revenues from derivative financial instruments are tax-exempt.

In terms of stamp duty, futures contracts are subject to stamp duty, and the Stamp Tax Law contains a provision that stipulates exception regarding futures contracts. According to this provision, futures contracts made only between banks, or through banks are exempted from the stamp tax. In this regard, derivative contracts to which banks do not become parties are subject to 9.48 ‰ stamp tax on the basis of contract value.

In terms of the corporate income tax, the derivative market transactions are subject to corporation tax to be collected by a 15% deduction.

In terms of the banking and insurance transactions tax (BITT), the amount of revenues gained from derivative market instruments with the exception of foreign exchange transactions are subject to 5% BITT. Futures market transactions made through banks are subject to 1 % BITT. Revenues gained as a result of derivative market transactions realized in a stock exchange established in Turkey (Borsa İstanbul A.Ş.) have been exempted from BITT.
References


Kutuk, O. (2014). Derivative Instruments and Applications in the Turkish Banking Sector, Social Sciences Institute, Department of Banking and Finance, Master Thesis, Başkent University, Ankara.

PART IV.

CHAP 2.

THE EFFICIENCY OF TAX ADMINISTRATION IN TURKEY

Hünkar GÜLER*, Hacer KABA**

Introduction

The main goal of taxation is to finance public needs. Taxes are also main components of public expenditures which include social programs such as health, education, social insurance and so on and also include infrastructure for investments. However, tax administrations and tax systems are dominated by financial globalization, tax competition, insufficiency of capital, current account deficits, debt services and debt stocks. These factors have been imposing many developing countries to highly trust their own funds like taxation. Turkey switched from the single tax system to modern tax system so as to strengthen its own resources. Tax reforms implemented in Turkey have consisted of two sections, one of which is about the tax structure and another is about the tax administration. In Turkey, tax administration is part of the Ministry of Treasury and Finance and responsible for collecting taxes effectively but it is not able to allocate its own budget, increase number of staffs, hire or dismiss new staffs and also arrange pay levels.

As it is known that tax administrations have to secure maximum tax receipts by lessening tax collection costs and tax expenditures. In this respect, the goal of this chapter is twofold. On the one hand, we introduce the Turkish tax system and tax administration to the rest of the world, on the other hand, we discuss the efficiency of tax administration and present new policy advices to cause tax administration more efficient. More generally, we evaluate the efficiency of tax administration in terms of tax audits, cost of tax collection, tax expenditures and the ratio of tax receipts collected to tax accruals as well. The rest of the chapter is organized as follows. We discuss how to become a efficient tax administration under fist title and then give a brief history of tax administration in Turkey under second title. In the third title, we assess the efficiency of tax administration in Turkey and this chapter is over by presenting consequences and political advices.

* Assistant Professor, Niğde Ömer Halisdemir University, Faculty of Economics and Administrative Sciences, Department of Public Economics, gulerhunkar@ohu.edu.tr.
** Research Assistant, Niğde Ömer Halisdemir University, Faculty of Economics and Administrative Sciences, Department of Public Economics, hkaba@ohu.edu.tr.
How To Become A Efficient Tax Administration

Tax policy, especially in developing countries, is affected by several factors such as technology, globalisation, major environmental challenges and world’s population. It means that “one size fits all” policy could no longer be valid. To create a good tax system, taxes should be collected regularly, consistently, conveniently and affordably. Moreover, if we keep in mind the recent developments in literature, a good tax system should ensure (i) enhanced electronic systems, (ii) reduced profit tax rates, (iii) reduced labor taxes and mandatory contributions, (iv) reduced taxes other than profit and labor, (v) simplified tax compliance processes or decreased number of tax filings or payments, (vi) introduced a risk-based tax audit selection system and (vii) introduced time limits for processing VAT cash refunds (WBG, 2018, p.17). Vermeend, Ploeg and Timmer (2008, p.59) also identify the good tax systems with sufficient and stable revenue yield, balance of efficiency and equity, minimum costs of administration and tax compliance.

This is to say, a good tax system has two main components which are related to principles of taxation and tax administration. Principles of taxation were promoted by Neumark and Heller. Heller developed principals of taxation such as cost-effectiveness, tax compliance, economic efficiency, harmonisation with other policy, income redistribution and ability to pay as a technical-administrative principals (Turhan, 1998, p.208). The efficiency of tax administration depends on many social, economic and political factors. Tax administration is widely expected to provide tax gap measurements, random audits and robust monitoring of risk (OECD, 2017, p.62). Globalizing world doesn’t let tax authorities control everything at the same time. Therefore, tax authorities make trade-off between tax rates and tax bases as Luffer said before. However, tax administrations employ Information and Communication Technology (ICT) to raise tax receipts. Today, electronic filing and payment is most common in the OECD high-income region, where 31 economies out of 33 have such systems in place followed by Europe and Central Asia with 21 economies using electronic systems. (WBG, 2018, p.14).

Tax administration must be effective and efficient. The most common definitions of these concepts are that the tax administration is effective when it achieves a high level of voluntary tax compliance and efficient when the tax administration’s costs are low in relation to the collected revenue (Pellechio and Tanzi, 1995, p.5). OECD’s notes on principles of good tax administration indicate that the effective tax administrations must know and follow the goals and challenges of revenue authorities. To do so, the main role of revenue authorities is to ensure compliance with tax laws. Voluntary compliance is provided with clear, simple and user-friendly administrative systems as well as an awareness of rights and expectation of a fair and efficient treatment. Revenue authorities are to, also, determine the opportunities and challenges related with the globalisation of the world’s economies and make good tax treaty with partners. Secondl, the effective tax administration have to promote sincere relationship with taxpayers by applying tax laws in a fair, reliable and transparent manner and also deliver accurate information
in time. Thirdly, the efficient tax administration identify and resolve conflicts between the public duties and private affairs of employee and last, enhance cordial relations with other tax administrations (OECD, 2001, pp.1-5).

A key role of tax administrations is to enable compliance with the tax laws and decrease the cost of tax collection. Martin (1944, p.104) said that cost of tax administration included two large elements, one of them is administrative expenses and another is taxpayer’s liability expenses. Apart from these, reforms to improve the tax system would create serious expenses. Tennant and Tennant (2007, p.91) underline that reforms to tax administrations have, however, not always resulted in increased efficiency because of the existence of bottlenecks within the administration that persist years after the completion of comprehensive reform programmes. Antonakas, Giokas and Konstantopoulos (2013, p.583) remark that the root causes of the corruption in tax administration are stemmed from penalty system (impunity), political intervention, the culture of the civil servant, the standards of values, the way civil servant are recruited and promoted and level of salaries. Kumar, Nagar and Samanta (2007, p.109) emphasize that tax administrations should ascertain stop-filers, penalise tax evaders, make delinquent taxpayers pay arrears and bring unregistered taxpayers to the tax fold to be an efficient and effective tax administrations. Moreover, tax administrations have to build a proper information system and share this information with taxpayers.

Performance of tax administrations rely on (i) integrated registration process for taxpayers, (ii) effective and low cost processing (assessment) of tax returns and tax payments, (iii) timely and effective support and services to help taxpayers fulfill their obligations, (iv) effective and timely verification interventions that confirm the accuracy of reported information, (v) effective and efficient interventions to collect overdue payments and returns, (vi) access to fast and cost effective tax disputes process (OECD, 2017, p.75). By the way, it is very hard to determine how efficient and effective tax administration is when vertical and horizontal equity must be provided at the same time. Tennant and Tennant (2007, p.73) point out major issues in tax administration. These issues are system of self-assessment wherein taxpayers have the responsibility to submit tax returns to the relevant tax departments. Generally speaking, this position refers to voluntary compliance which is influenced by the efficiency, effectiveness and equity of the tax administration. Tennant and Tennant (2007, p.91) state that tax administrations foster a culture of compliance within countries by ensuring that their operations are simple, transparent and expeditious.

Kumar, Nagar and Samanta (2007, p.109) emphasize that important obstacles to taxpayers’ voluntary compliance are the perceived inequity of the tax system, complexity of tax laws, lack of fairness of the penalty system and weak taxpayer education programmes. OECD (2017, p.19) also reports that tax compliance is carried out by simplifying tax requirements, practicing co-operative arrangements, changing international landscape and managing compliance. To convert
the tax administration to be a taxpayer-friendly, policy makers are to, first, arrange the instrumental and structural perspective of tax agencies; secondly, provide the taxpayer’s needs efficiently and last, give taxpayer correct information in time (Aberbach and Christensen, 2007, p.156). As we shall see from Table 1, some of them was expressed above, tax compliance is achieved by employing enforcement and collaborative measures.

Table 1. Components of Tax Compliance Strategies

<table>
<thead>
<tr>
<th>Enforcement Measures</th>
<th>Collaborative Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gradual sanctions and penalties</td>
<td>Simplifying compliance and increasing customer orientation</td>
</tr>
<tr>
<td>Campaigns to increase perceived risk</td>
<td>Clarifying taxpayer obligations; support and advice</td>
</tr>
<tr>
<td>Greater visibility of the tax authority</td>
<td>Paying greater attention to facilitating communication between taxpayer and tax authority; messaging and framing</td>
</tr>
<tr>
<td>More targeted audits</td>
<td>Improving tax education, especially targeted at youth</td>
</tr>
<tr>
<td>Improved detection</td>
<td>Prompting taxpayers ahead of payment deadlines (friendly reminders instead of fines)</td>
</tr>
<tr>
<td></td>
<td>Providing opportunities for correction and prevention</td>
</tr>
</tbody>
</table>

Source: WBG, 2018, p.43.

**A Brief History of Tax Administration in Turkey**

There have been several important reforms in Turkish tax system to create a modern tax system since 1920s. These are to, first, abolish dime levy in 1925 and replace this levy with transaction tax in 1927; second, employ personnel income and corporate taxes and also establish tax procedure law (Vergi Usul Kanunu, VUK) in 1950 and last, impose Value-Added Tax (VAT) as a general consumption tax in 1985 and then place a excise duty as a special consumption tax in 2002 (Güler, 2016, p.126). In 1920s, Turkish government had three crucial economic reforms which are to transfer to free market economy, ensure budget balance and also modernize the Turkish tax system. In fact, at the beginning of 1920s, there were 70 various taxes employed in Turkey. Taxes transferred to new Turkish state were dime levy (aşar), cattle tax (ağnam), road tax (bedel-i tarik vergisi), house tax (müpakkafat vergisi), land (property) tax, dividend tax, customs duty and stamp duty. The most crucial one within these taxes was dime levy which was charged 10 percent from agricultural production and created 25 percent of budget revenues. Dime levy was abolished in 1925 because of tax farming (tumar) and preventing the agricultural production. (Vural, 2008, p.20).
Table 2. The Structure of Turkish Tax System at The Beginning of 1920s (Thousands ₺)

<table>
<thead>
<tr>
<th>Years</th>
<th>Goods and Services</th>
<th>International Trade</th>
<th>Total</th>
<th>Percentage</th>
<th>Income</th>
<th>Wealth</th>
<th>Total</th>
<th>Percentage</th>
<th>Tax Receipts</th>
<th>Budget Revenue</th>
<th>Budget Expenditures</th>
<th>TR/BR</th>
<th>Budget Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1923</td>
<td>23.729</td>
<td>25.402</td>
<td>49.131</td>
<td>52</td>
<td>35.059</td>
<td>11.164</td>
<td>46.223</td>
<td>48</td>
<td>95.354</td>
<td>111.272</td>
<td>105.926</td>
<td>86</td>
<td>5.0</td>
</tr>
<tr>
<td>1924</td>
<td>31.831</td>
<td>28.950</td>
<td>60.781</td>
<td>53</td>
<td>43.979</td>
<td>10.426</td>
<td>54.405</td>
<td>47</td>
<td>115.186</td>
<td>138.416</td>
<td>131.628</td>
<td>83</td>
<td>5.2</td>
</tr>
<tr>
<td>1925</td>
<td>50.718</td>
<td>43.395</td>
<td>94.113</td>
<td>68</td>
<td>20.496</td>
<td>23.661</td>
<td>44.157</td>
<td>32</td>
<td>138.270</td>
<td>170.390</td>
<td>201.450</td>
<td>81</td>
<td>-15.4</td>
</tr>
<tr>
<td>1927</td>
<td>91.747</td>
<td>29.851</td>
<td>121.598</td>
<td>74</td>
<td>16.146</td>
<td>25.611</td>
<td>41.757</td>
<td>26</td>
<td>163.355</td>
<td>202.239</td>
<td>198.951</td>
<td>81</td>
<td>1.7</td>
</tr>
<tr>
<td>1928</td>
<td>98.021</td>
<td>40.278</td>
<td>138.299</td>
<td>77</td>
<td>15.859</td>
<td>25.801</td>
<td>41.660</td>
<td>23</td>
<td>180.059</td>
<td>220.168</td>
<td>201.133</td>
<td>82</td>
<td>9.5</td>
</tr>
<tr>
<td>1929</td>
<td>87.493</td>
<td>49.780</td>
<td>137.273</td>
<td>75</td>
<td>14.850</td>
<td>30.412</td>
<td>45.262</td>
<td>25</td>
<td>182.535</td>
<td>224.144</td>
<td>213.367</td>
<td>81</td>
<td>5.1</td>
</tr>
</tbody>
</table>


Table 2 shows that Turkish tax system in 1920s consisted of direct taxes (income and wealth) and indirect taxes (good and services and international trade). The ratio of direct taxes to tax receipts was 48 percent whereas the ratio of indirect taxes to tax receipts was 52 percent in Turkey. After dime levy was abolished, the ratio of direct taxes decreases to 28 percent in 1927. Having said that dime levy generated 25 percent of tax receipts before it was abolished. In Turkey, the main direct taxes are personal income and corporate taxes which are classified as pay-as-you-earn (PAYE), while the principal indirect taxes are value-added tax and excise duty. As it shown in Table 2, there was budget surplus from 1923 to 1929 except 1925. Turkish tax administration was not able to close the tax revenue gap until personel income and corporate taxes were employed in 1950. Today, direct taxes consist of personal income tax (1960), corporate tax (2006), inheritance tax (1959), motor vehicles tax (1963), property tax (1970) and environment tax (1993) whereas indirect taxes consist of value-added tax (1985), excise duty (2002), special communication tax (1999), customs duty (1999), banking and insurance transactions tax (1956), lottery tax (2004), stamp duty (1964) and fees (1964) (Mutlu and Çelen, 2012, p.35).
Table 3. The Ratio of Tax Receipts Collected to Tax Accruals

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Taxes on Income</td>
<td>Taxes on Wealth</td>
<td>Taxes on Consumption</td>
<td>Other Taxes</td>
</tr>
<tr>
<td>2010</td>
<td>81.6</td>
<td>65.2</td>
<td>87.7</td>
<td>92.9</td>
</tr>
<tr>
<td>2011</td>
<td>81.6</td>
<td>69.7</td>
<td>85.2</td>
<td>93.9</td>
</tr>
<tr>
<td>2012</td>
<td>84.3</td>
<td>71.0</td>
<td>85.3</td>
<td>93.8</td>
</tr>
<tr>
<td>2013</td>
<td>84.0</td>
<td>70.8</td>
<td>86.3</td>
<td>93.1</td>
</tr>
<tr>
<td>2014</td>
<td>82.6</td>
<td>69.3</td>
<td>84.3</td>
<td>92.5</td>
</tr>
<tr>
<td>2015</td>
<td>82.6</td>
<td>67.9</td>
<td>83.7</td>
<td>92.6</td>
</tr>
<tr>
<td>2016</td>
<td>78.0</td>
<td>66.6</td>
<td>79.5</td>
<td>92.2</td>
</tr>
<tr>
<td>2017</td>
<td>79.9</td>
<td>66.7</td>
<td>79.6</td>
<td>93.1</td>
</tr>
</tbody>
</table>


In recent decades, especially after 1980s, Turkish tax system has been serious structural issues which are derived from current balance deficits, insufficiency of capital, tax competition and international agreements. Whereas Turkish tax system is able to place a levy on consumption, it is not succeeded in taxing income and wealth. From a different point of view, Turkish tax system can easily collect taxes on consumption instead of on income and wealth. Therefore, Turkish tax system has been shifting on indirect taxes and this result, ultimately, give rise to break the equity of taxation and income redistribution. Table 3 indicates the ratio of tax receipts collected to tax accruals. While we take into account the tax system as a whole, we can easily see that there is crucial difference between tax receipts and tax accruals. In 2017, the ratio of tax receipts to tax accruals is almost 11 percent and this ratio is equal to the ratio of tax receipts to budget revenues. In other words, there are tax losses as large as the budget tax-free revenues. The largest losses of tax receipts have been observing taxes on wealth, taxes on income and taxes on consumption respectively since 2010. Table 3 also indicates the budget balances from 2010 to 2017. Budget deficits have been fluctuating form -13.6 percent in 2010 to -7.0 percent in 2017.

Table 4, below, presents the tax amnesty laws in Turkey. It’s obvious that there have been many tax amnesties carried out in Turkey regardless of it’s success. Martin and Camarda (2017, p.2), enumerate the advantages of tax amnesties such as increase of tax receipts in a short term and improvement of tax harmonisation, encouragement of capital inflow and investments in a medium term whereas the disadvantages of tax amnesties such as money laundering, terrorism
financing, demotivating taxpayers who pay their debts regularly and preventing access to information. It’s highlighted that burdens on tax courts and insufficiency of tax audits have kept tax amnesties carrying out in Turkey. There have been 34 tax amnesties enacted in Turkey since 1920s, 8 of which were enacted after 2000 and thus tax amnesties have been implemented in every 2.5 years in average. Tax amnesties enacted in Turkey every 2.5 years in average break the taxpayer’s motivation. However, tax amnesties are part of the tax policy and they are being carrying out seriously.

Table 4. Tax Amnesty Laws in Turkey

<table>
<thead>
<tr>
<th>Item No</th>
<th>Approval Date</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17 May 1924</td>
<td>First tax amnesty</td>
</tr>
<tr>
<td>2</td>
<td>5 August 1928</td>
<td>Tax amnesties for the region of Kars-Ardahan-Batum</td>
</tr>
<tr>
<td>3</td>
<td>15 March 1934</td>
<td>Law No. 4530, which is about the amnesty of asset tax arrears</td>
</tr>
<tr>
<td>4</td>
<td>4 July 1934</td>
<td>Law No. 2566, which is about the amnesty of tax arrears</td>
</tr>
<tr>
<td>5</td>
<td>29 June 1938</td>
<td>Law No. 3568, which is about the amnesty of property tax arrears</td>
</tr>
<tr>
<td>6</td>
<td>13 June 1946</td>
<td>Law No. 4920, which is about taking the Government Forestry Enterprises away from Taxes</td>
</tr>
<tr>
<td>7</td>
<td>21 Jan. 1947</td>
<td>Law No. 5050, which is about the amnesty of agricultural tax arrears</td>
</tr>
<tr>
<td>8</td>
<td>26 Oct. 1960</td>
<td>Law No. 113, which is about the general tax amnesty.</td>
</tr>
<tr>
<td>9</td>
<td>28 Dec. 1961</td>
<td>Law No. 281, which is about the amnesty and suspension of certain tax penalties</td>
</tr>
<tr>
<td>10</td>
<td>23 Feb. 1963</td>
<td>Law No. 218, which is about the amnesties of certain tax crimes and their penalties</td>
</tr>
<tr>
<td>11</td>
<td>13 June 1963</td>
<td>Law No. 252, which is about the amnesty of the sports club’s tax debts</td>
</tr>
<tr>
<td>12</td>
<td>5 Sep. 1963</td>
<td>Law No. 325, which is about the amnesty of state-owned enterprises’ tax debts</td>
</tr>
<tr>
<td>13</td>
<td>16 July 1965</td>
<td>Law No. 691, which is about the amnesties of municipalities and their enterprises’ tax debts</td>
</tr>
<tr>
<td>14</td>
<td>3 August 1966</td>
<td>Law No. 780, which is about the amnesties of certain tax crimes and their penalties</td>
</tr>
<tr>
<td>15</td>
<td>28 Feb. 1970</td>
<td>Law No. 1319, which is about the amnesties of estate taxes.</td>
</tr>
<tr>
<td>16</td>
<td>15 May 1974</td>
<td>Law No. 1803, which is about the amnesties of certain tax crimes and their penalties</td>
</tr>
<tr>
<td>17</td>
<td>20 March 1981</td>
<td>Law No. 2431, which is about the acceleration of collecting tax receipts and reporting the wealth components which are out of reports</td>
</tr>
<tr>
<td>18</td>
<td>2 March 1982</td>
<td>In Addition to Law No 2431</td>
</tr>
</tbody>
</table>
### Item No | Approval Date | Coverage
--- | --- | ---
19 | 22 Feb. 1983 | Law No. 2801, which is about the collection of certain public credits under tax settlement
20 | 4 Feb. 1985 | Law No. 3239, provisional article 4, which is about the amendments for certain tax laws
21 | 3 Dec. 1988 | Law No. 3505, provisional article 1
22 | 28 Dec. 1988 | Law No. 3512
23 | 15 Dec. 1990 | Law No. 3689, provisional article 1
24 | 21 Feb. 1992 | Law No 3787
25 | 5 Sept. 1997 | Public notification of tax collection No. 400
26 | 22 July 1998 | Law No 4369
27 | 6 Feb. 2001 | Public Notification No. 414 on Tax Collection
28 | 7 March 2002 | Law No. 4746, which is about the amnesties of estate taxes
29 | 27 Feb. 2003 | Law No. 4811, which is about the amnesty of tax peace
30 | 22 Nov. 2008 | Law No. 5811, which is about the gaining of certain assets to the national economy
31 | 25 Feb. 2011 | Law No. 6111, which is about the restructuring of certain public credits
32 | 29 May 2013 | Law No. 6486, which is about the amending of social security and general health insurance law and certain laws (second cash repatriation law)
33 | 10 Sept. 2014 | Law No. 6552, which is about the restructuring of certain public credits and amending of labor law and certain laws and secondary laws
34 | 19 Aug. 2016 | Law No. 6736, which is about the restructuring of certain public credits

**Source:** [http://www.gib.gov.tr](http://www.gib.gov.tr) (GİB)

Tax administrations are part of the public sector in most countries and Turkey as well. Turkish tax administration has been working hard to establish a modern tax system. In Turkey, tax authority has responsibility for tax compliance, tax collection and all taxpayer services. The structure of tax administration in Turkey is shown in Figure 1. The chairmanship is a subsidiary of Ministry of Treasury and Finance and respected as a general budget administrations. The chairmanship is also arranged as Central and Sub-Central Services. Central Services consist of Main Services, Advisory Services, Auxiliary Services and Sub-Central Services. Sub-Central Services also consist of Tax Office Directorates and General Units of Financial Office. In Turkey, the degree of autonomy is given by government to tax administrations. Turkish tax administration is not able to allocate its own budget, increase number of staffs, hire or dismiss new staffs and negotiate staff pay levels (OECD, 2010, p.23). These are all the weaknesses of Turkish tax administration. The structure of Turkish tax administration is given in detail in figure 1.
Assessing The Efficiency of Tax Administration in Turkey

Three substantial trends have been observed in the optimal tax policy around the world. These trends are to, first, place a levy on personal income proportionally; second, have a zero marginal tax rate for higher income and last, make taxation shift to indirect taxes. As a result, shifting taxation on indirect and labor-income taxes in Turkey has created tax corridors (tax traps), which makes the sustainability of tax receipts even more difficult. OECD countries measure the efficiency and effectiveness of tax administration with their total tax receipts as a percentage of Gross Domestic Product (GDP) and also the cost of tax collection ratio. OECD countries’s tax statistics show that net revenue yield of personal income tax is 27 percent, corporate income tax is 18 percent, VAT is 26 percent, social security contribution is 10 percent and others are 19 percent in 2015. (OECD, 2017, p.36). However, in Turkey, net revenue yield of personal income tax is 22.7 percent, corporate income tax is 8.0 percent, VAT is 33.1 percent and others are 36.2 percent. When we compare Turkey’s tax receipts to OECD’s averages, it’s obvious that Turkey can easily collect taxes on consumption but not on income. Turkey is not able to gain tax receipts from corporate income tax which is 8.0 percent in Turkey and 18 percent in OECD countries. In 2016, average tax receipts of OECD countries as a percentage of GDP is 34.3 percent and Turkey’s is 25.5 percent.

In 2013, cost of tax collection (administration cost/total tax receipts) in OECD countries is estimated as follows. Australia 0.93 percent, Canada 1.15 percent, Denmark 0.48 percent, France 1.11 percent, Finland 0.75 percent, Germany 1.35 percent, Hungary 1.15 percent, Japan 1.74 percent, Mexico 0.69 percent, Norway 0.41, Italy 1.05 percent, Spain 0.67 percent, Sweden 0.39 percent, Switzerland 0.29 percent, Turkey 0.64 percent, United Kingdom 0.73 percent and United States 0.47 percent respectively. This means that, for instance in Turkey, to collect 100 ₺ of tax receipts, tax authority should spend 0.64 ₺ as a cost of tax collection (OECD, Stat). This ratio is the highest in Japan and higher in European countries such as France, Germany and Hungary than other countries. This ratio is lower in social welfare countries such as Denmark, Norway, Sweden and Finland. It’s pretty worth knowing this information which shows that voluntary compliance is insured in social welfare states where citizens have heavy tax burdens and benefit from a great amount of public expenditures.
Figure 1. The Structure of Tax Administration in Turkey
Table 5. The Ratio of Audited Taxpayers in Turkey

<table>
<thead>
<tr>
<th>Years</th>
<th>Number of Taxpayers</th>
<th>Number of Audited Taxpayers</th>
<th>Audited Taxpayers Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2,367,721</td>
<td>16,267</td>
<td>0.68</td>
</tr>
<tr>
<td>2012</td>
<td>2,422,975</td>
<td>46,845</td>
<td>1.93</td>
</tr>
<tr>
<td>2013</td>
<td>2,460,281</td>
<td>71,352</td>
<td>2.90</td>
</tr>
<tr>
<td>2014</td>
<td>2,472,658</td>
<td>55,284</td>
<td>2.24</td>
</tr>
<tr>
<td>2015</td>
<td>2,527,084</td>
<td>58,676</td>
<td>3.32</td>
</tr>
<tr>
<td>2016</td>
<td>2,541,016</td>
<td>49,817</td>
<td>1.96</td>
</tr>
<tr>
<td>2017</td>
<td>2,636,370</td>
<td>44,182</td>
<td>1.68</td>
</tr>
</tbody>
</table>

Source: www.gib.gov.tr (GİB).

Table 5 shows the ratio of audited taxpayers in Turkey. At the first glance, tax auditing ratio is seen very low. The ratio of audited taxpayers 0.68 percent in 2011 and 1.68 percent in 2017. Unfortunately, this is valid for Turkey. When it’s considered that taxpayers in Turkey have not been able to achieve voluntary compliance with taxes as well as tax authority has great difficulty in auditing, tax receipts can be hardly raised. A caveat resulted from Table 5 is that Turkey should increase the number of tax audits.

Table 6. Tax Audit Results In Regard To Types of Taxes (2017)

<table>
<thead>
<tr>
<th>Types of Taxes</th>
<th>Number of Active Taxpayers</th>
<th>Number of Taxpayers Audited</th>
<th>Number of Reports Done</th>
<th>Reported Tax Base</th>
<th>Tax Payable</th>
<th>Differences Between Reported and Actual Tax Base</th>
<th>Differences Between Tax Payable and Actual Tax</th>
<th>Differences Between Reported and Actual Tax Base (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personel Income Tax</td>
<td>1877128</td>
<td>661</td>
<td>995</td>
<td>30204542</td>
<td>7934967</td>
<td>29276238</td>
<td>7811320</td>
<td>97.1</td>
</tr>
<tr>
<td>Corporate Tax</td>
<td>759242</td>
<td>240</td>
<td>339</td>
<td>75744575</td>
<td>4623881</td>
<td>16468127</td>
<td>4522137</td>
<td>21.8</td>
</tr>
<tr>
<td>Value-Added Tax</td>
<td>2583610</td>
<td>1049</td>
<td>1415</td>
<td>4.623E+09</td>
<td>24100084</td>
<td>105211516</td>
<td>19706425</td>
<td>2.3</td>
</tr>
<tr>
<td>Excise Duty</td>
<td>n.a.</td>
<td>130</td>
<td>150</td>
<td>70110</td>
<td>2283009</td>
<td>3222627</td>
<td>2250932</td>
<td>4761</td>
</tr>
<tr>
<td>Banking and Insurance Transactions Tax</td>
<td>4397</td>
<td>8</td>
<td>11</td>
<td>n.a.</td>
<td>31352</td>
<td>328615</td>
<td>29554</td>
<td>n.a.</td>
</tr>
<tr>
<td>Inheritance Tax</td>
<td>n.a.</td>
<td>1</td>
<td>2</td>
<td>n.a.</td>
<td>11075</td>
<td>117000</td>
<td>11075</td>
<td>n.a.</td>
</tr>
</tbody>
</table>
Table 6 indicates the tax audit results in regard to types of taxes for 2017. According to Table 6, the largest amount of tax receipts and tax base differences arises from VAT whereas the largest ratio of these differences arises from excise duty. When it’s considered that VAT is collected both on goods and services as excise duty is just collected on goods, the amount of tax receipts and tax base differences on excise duty is less. Therefore, tax losses stemming from excise duty can be tolerated easily. Tax base difference on personal income tax is 97.1 percent whereas tax base difference on corporate tax is 21.8 percent. This position proves that taxes on income are still serious problem for Turkish tax system.

Table 7. Tax Expenditures in Turkey (2016)

<table>
<thead>
<tr>
<th>Taxes</th>
<th>Tax Expenditures (Million ₺)</th>
<th>Tax Receipts (Million ₺)</th>
<th>Tax Expenditures/Tax Receipts (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Income Tax</td>
<td>40,319</td>
<td>96,605</td>
<td>41,7</td>
</tr>
<tr>
<td>Corporate Tax</td>
<td>10,707</td>
<td>42,970</td>
<td>24,9</td>
</tr>
<tr>
<td>Value-Added Tax</td>
<td>24,685</td>
<td>130,823</td>
<td>18,9</td>
</tr>
<tr>
<td>Excise Duty</td>
<td>13,346</td>
<td>120,402</td>
<td>11,1</td>
</tr>
<tr>
<td>Motor Vehicles Tax</td>
<td>587</td>
<td>9,986</td>
<td>5,9</td>
</tr>
<tr>
<td>Banking and Insurance Transactions Tax</td>
<td>3,893</td>
<td>11,068</td>
<td>35,2</td>
</tr>
<tr>
<td>Special Communication Tax</td>
<td>368</td>
<td>4,976</td>
<td>7,4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>93,905</strong></td>
<td><strong>416,830</strong></td>
<td><strong>22,5</strong></td>
</tr>
</tbody>
</table>

Tax expenditures consist of allowances, tax exemptions, rate relief, tax deferral and tax credits (OECD, 2010b: 12). Table 7 shows the tax expenditures in Turkey for 2016. The ratio of tax expenditures to tax receipts is 22.5 percent and this ratio is bigger than 19 percent of tax receipts which given up for covering the social security deficits. As it’s seen that tax expenditures and social security deficits generate a large amount of burden on budget. However, tax expenditures performed for personal income tax have the largest amount with the share of 41.7 percent within other taxes. Moreover, tax expenditures in Banking and Insurance Transactions Tax are 35.2 percent, in Corporate Tax 24.9 percent and in VAT 19.9 percent respectively.

Conclusion

In this chapter, we introduced the Turkish tax system and tax administration to the rest of the world and analyzed the efficiency of tax administration in terms of tax audits, cost of tax collection, tax expenditures and the ratio of tax receipts collected to tax accruals as well. As far as we examined up to this point, Turkish tax system has been serious structural issues such as shifting taxation on indirect and labor-income taxes, which are derived from current balance deficits, insufficiency of capital, tax competition and international agreements. Whereas Turkish tax system is able to place a levy on consumption, it is not succeeded in taxing income and wealth.

Cost of tax collection (administration cost/total tax receipts) in Turkey is estimated 0.64 percent in 2013. It’s compared with OECD countries, Turkey’s cost of tax collection performance is favorable. Moreover, we can not say the same things for the performance of tax expenditures, tax audits and the ratio of tax receipts to tax accruals. In 2016, the ratio of tax expenditures to tax receipts is 22.5 percent and this ratio is bigger than 19 percent of tax receipts which given up for covering the social security deficits. As it’s seen that tax expenditures and social security deficits generate a large amount of burden on budget. However, tax expenditures performed for personal income tax have the largest amount with the share of 41.7 percent within other taxes. Moreover, tax expenditures in Banking and Insurance Transactions Tax are 35.2 percent, in Corporate Tax 24.9 percent and in VAT 19.9 percent respectively.

Tax auditing ratio is seen very low in Turkey. The ratio of audited taxpayers 0.68 percent in 2011 and 1.68 percent in 2017. And also, tax base difference on personal income tax is 97.1 percent whereas tax base difference on corporate tax is 21.8 percent. This position proves that taxes on income are still serious problem for Turkish tax system. When it’s considered that taxpayers in Turkey have not been able to achieve voluntary compliance with taxes as well as tax authority has great difficulty in auditing, tax receipts can be hardly raised. Turkey should increase the number of tax audits and decrease the tax expenditures.
References


THE RELATIONSHIP BETWEEN TAX AUDIT AND TAX COLLECTION IN TURKEY: ARDL BOUNDS TESTING APPROACH

Huseyin KUTBAY

Introduction

The governments undertaking gigantic public expenditures on behalf of its citizens for the provision of basic facilities and other social services also need public revenues close to public expenditure level or equivalent to public revenues to fulfill their responsibilities. The taxes which are among different kind of resources can able to obtain as income by governments, functions as most important and most reliable one due to contributing so much more than other resources. For this reason the tax, in order to finance the public expenditures is expressed as a compulsory practice which carries out by governments over income, expenditure or wealth of an individual, family, community, legal persons or non-institution organizations. Namely, taxation is defined as an internal power of government that is practiced via legislature in order to bring fiscal burden to subjects in its competence field on behalf of fulfilling the lawful tasks of government intended to be increased its incomes. The government is fulfilling this duty it’s based on a constitutional power. For example, tax administration in Turkey, acts based on Article 73 of 1982 Constitution for collection of tax incomes. In this article; “Everyone is obliged to pay taxes according to their financial power to meet public expenses” is said. Effective collection of tax revenues that is, the high rate of tax effort (tax collection/tax liability) also increases the coverage ratio of public expenditures that the state has undertaken. It also contributes to the government’s ability to repay the difference between tax revenues and public expenditures at a lower rate. But, generally reactions (tax avoidance, tax evasion) that have showed by taxpayers in the face of public expenditures and tax burden that implemented by government in developing economies may decrease tax effort ratio. Because Turkish tax system also as in the modern tax systems, is based on a declaration that means to declare the earnings of taxpayers to income administration with their own will. Therefore, in order for taxation to be collected effectively and efficiently, the correctness of these statements must be determined. This can only be achieved by providing an effective tax audit. As a matter of fact some taxpayers have not
declared part or all of their income to pay less tax so, this reveal the importance of tax audit. Because, whether taxes that are declared reflects the truth or not, emerges with a well working tax audit. Hence, tax audit has the real aim is to search the accuracy of declarations of taxpayers, to review the practices of tax laws and to determine negative results which will be have emerged because of practices of laws and also to ensure to collect taxes completely and just in time (to increase ratio of tax effort) has a key role in determination of accuracy of declarations of taxpayers. In this study, the relationship between tax audit and collection was analyzed by considering annual data for the years 1984-2017. As a result of the analysis, a positive relationship was found between tax audit and tax collection.

**Tax Audit**

Tax audit, is an investigation of tax report of a person or an institution by relevant tax authorities in order to coordinate the tax laws and the state regulations in force. Also to ensure to be appropriate to laws and regulations of reported and paid tax amount of commercial records and financial affairs of taxpayers is defined as tax audit (Nwaiwu & Macgregor, 2018, p. 38). Tax audit has importance regarding the collecting necessary tax incomes for budget, ensuring economic, financial system and stability, helping to government for ensuring satisfactory feedbacks from taxpayers, regulation of tax evasion level, ensuring to follow taxpayers tax laws strictly, improving voluntary compatibility level of taxpayers, ensuring the collection of amount to pay and the refund it to government (Mirera, 2014). According to the OECD (2006), tax audit refers to a review regarding whether a taxpayer determines his tax debt correctly or not, and whether they declare their tax liabilities or not, and whether they fulfill their other liabilities or not. In article 134 of Tax Procedure Law (TPL): 213 also features of tax audit which defines the investigating, determining and ensuring of correction of taxes has given as follows (Akdeniz, 2010, p. 52);

- Tax audit is a legal audit,
- Tax audit is objective,
- Tax audit has sanctions,
- Tax audit is an account audit,
- Tax audit is an audit which has public nature,
- Tax audit is a searcher and finder,
- Tax audit, is a practice that gives assurance with financial charts to shareholders of a company and other beneficiaries because of being independent and objective.
Regarding tax audit, besides the searching, determining and providing of correction of taxes and also aims like ensuring correction and voluntary declaration, making tax declarations reliable, reducing tax evasion and anti-smuggling interdictions are considered (Akdeniz, 2010, p. 272). However, to achieve these goals, the supervisory staff must also have sufficient numbers. In order for the tax audit to be effective, it is necessary to have some qualifications and technical knowledge and skills as well as a sufficient number of supervisory staff to examine. These knowledge and skills are described below (Nwaiwu & Macgregor, 2018, p. 38);

✓ Must be have a good knowledge regarding the accounting and taxation,

✓ Must be rigorous about interpretation of tax laws (no dispute),

✓ Must be have a high intelligence in the implementation of the tax laws,

✓ Must be have a good knowledge about research techniques

✓ Besides the technical skills, must be vigilant with communication skills and open-minded.

With tax Audit (i) in order to adapt to developing and changing economy, establishing practicable and effective tax management system (ii) putting into practice the strategies to solve tax conflicts between tax office and taxpayers (iii) in order to fight with tax avoidance techniques, sustaining a powerful system which are already available for some institutions but it’s still open to tax abuse (iv) preparing tax declarations by taxpayers completely and in time (v) transferring information to tax offices in order to ensure tax collection at high ratio(increasing tax effort ratio) (vi) helping to government to collect appropriate tax incomes which are necessary for budget, protecting economic, financial system and stability (vii) and ensuring to taxpayers to follow tax laws strictly are intended (Badara, 2012, p. 75). Role in the modern tax administration of a tax audit program argued to be beyond the verifying declaration obligations of taxpayers and inconsistency between declaration of taxpayers and supplementary documents. Because most of taxpayers, if they believe that tax administration has capacity to determine undeclared obligations and also may implement the heavy punishments when it determined, in such case taxpayers reports their obligations correctly. In this situation, tax audit, in increasing of tax incomes takes role in two different way; (i) through additional tax evaluation (directly) and (ii) via encouragement the thorough reporting of obligations by all taxpayers (Biber, 2010). Additionally, tax audit is to ensure compliance to laws and regulations of taxpayers by controlling tax evasion case (Barreca & Ramachandran, 2004). Because, taxpayer will not approach to pay in case of no tax audit or ineffective and knowing to abstain from tax payment obligations is possible. For this reason, tax audit is an important tool regarding the ensuring taxpayers to pay their taxes (Dumlupınar & Yardimcioglu, 2015, p. 3).

In addition to earning direct revenues as a result of audit activities, the highest risk situations and ineligible taxpayers can be identified effectively. Also, there would be some sanctions for
these, so taxpayers will be aware of any attempt to abstain from tax evasion which will be too risky because there would be penalties for any inappropriate situations during tax audit. Therefore, tax audits; in instead of affecting to taxpayers which chosen merely for audit and before everything rather than collecting the taxes which need to pay, have an important sanction in most of societies (Mebratu, 2016, p. 4). But in order to be sanctions effective, both audit staffs must be enough and audit not merely of big companies, must be done effectively for all companies as well. As a matter of fact, according to Slemrod (2000), the level of tax audit, which is one of the most effective policies to prevent tax evasion behavior, depends on how many taxpayers are selected for audit and how intensive audit is. The effectiveness in auditing is expressed in the form of reaching the goal that is expected as a result of the audits performed by the administration or the consistency of the selected targets and the actual results. Effectiveness in audit in terms of tax audit, is expressed as the level fulfilling audit functions that implement by tax administration for the purpose of ensuring taxpayers to behave properly to tax laws of taxpayers or ensuring taxpayers to follow laws by minimizing tax loss and evasion (Bessel, 2017, p. 71). However, it is not possible to achieve effectiveness and efficiency in tax audit only with a few measures and arrangements to be taken in the tax audit system. It will be appropriate to focus on the following factors that affect the effectiveness of tax audit and reduce tax administration effectiveness (Aytekin, 2007, p. 88);

✓ Multiplicity of the number of tax laws and making alterations on frequently,
✓ Not recognizing preparation period for changing the tax laws and implementing,
✓ Not to be implemented tax penalties and also enacting tax amnesty frequently,
✓ Insufficient of tax payment awareness of taxpayers.

**Tax Audit in Turkey**

Tax audit notion that functions in Turkey, is defined as a period (external audit) that consists of inspection, tax review, searching and data collection on taxpayers in order to ensure tax security and also defined as review of revenue administration and investigation of staffs (internal audit) as well (Sarılı, 2003, p. 103). In this study, an external audit, which expresses the examination on the taxpayers, is taken. “Inspection” in scope of external audit in article 127 of Tax Procedure Law, is defined as investigating and determining material events, records and issues related to liability and taxpayer. Inspection is not limited only with starting work, quitting work and changing work of taxpayers. The main objective in the inspection is to identify many issues related to the tax-causing event (Tecim, 2008, p. 88). Also persons those who did not declare their liability and also untaxed resources revealed by inspection (Association of Account Experts, 2004, p. 132). Thus, inspection provides tax justice and social justice by reducing informality as it can prevent taxpayers from being tax-exempt. Inspection can be done at
any time. When inspection will be done, cannot declare to related persons. According to this, authorized persons who will inspection, not temporary or at any specific times, within whole year and everytime (24 hours a day) can do inspection. For legal qualification of review-inspection results, all of these need to be documented. The results of inspection transfer to ‘inspection voucher’ which is regarded as report.

“Tax review” in article 134 of Tax Procedure Law, is defined as searching, identifying and ensuring of correction of taxes to pay. In the tax review, the administration is obliged to investigate the correctness of taxation and to determine the deficiencies (Ünal, 2014, p. 49). The intent of the tax review is to determine the correctness and deficiencies of the tax. This type of audit, is also defined as a deeply research in order to ensure correction of declarations and taxes which need to pay, in terms of searching, identifying, evaluating of real sides of transactions which is not shown on the record and declaration or does with declaration, record, document and inventory of taxpayers and also ensuring correction of taxes to pay (Dogan, 2015, p. 61). In practice, there are available different type of tax reviews such as in terms of relationship audited and auditor (external and internal audit), in terms of resources of review (ordinary, extraordinary and against) and in terms of scope (full, limited and short). In Graph 1 tax reviews, are shown according to classification of full and limited review. Regarding the sort of tax that taxpayers depends, searching compliance of all activities and transactions to laws in the term of taxation, identifying correction of tax which needs to pay by reviewing all tax base elements is defined as full review (Tecim, 2008, p. 97), in one period of taxation, not all sort of taxes that taxpayers have liability, identifying just one sort of taxes and besides considering the elements of tax base if it would be considered with a little part, this defines as limited review(Aytekin, 2007, p. 48).

Graph 1: Tax Review Results by Scope

In calculation of number of total reviews, if many more terms reviewed for a taxpayer, each of terms is considered as a different review. Because as a rule, tax review that carries out without informing, including the accounting period which is not taken its result, can do till the end of assessment prescription (5 years). A tax audit can be done again for the same period, even if a prior inspection or tax assessment has been made. (In Article 138-TPL). When looked at the datas in Graph 1, it is seen that a maximum of 25% of the total examinations are composed of full examinations and the remaining portion is of limited examinations. This shows that not only all income elements of the taxpayers but only a certain economic value of a certain income element are examined. In full review that lasts one year or more, all tax liabilities of taxpayers are reviewed comprehensively. Also when necessary, the workplace is visited and the counting is carried out and also informations and documents that are taken from third persons and institutions are compared. In the case of limited review for a period of maximum six months, taxpayers are only audited for certain issues and taxes, and full and limited reviews are made routinely (Akbey, 2014, p. 78).

The tax reviews carried out in this context; is began basically with five main sources as follows by tax inspectors, assistants of tax inspectors, most authoritative goods officer of province or managers of tax administration (Presidency of Tax Review Board - PTRB Activity Report, 2017, p. 15; in Article 135-TPL);

- The examinations, carried out by the Center of Risk Analysis in Presidency of Tax Review Board (PTRB-CRA), on the sectors and taxpayers considered risky as a result of the analyzes and comparisons made using all kinds of information belonging to the taxpayer,

- The examinations carried out on the basis of denunciations and complaints,

- The examinations carried out on the basis of the findings made during the inspection, investigation, reviewing and audits,

- Reviewing and audit reports and reviewing demands that consist of tax matters directly or indirectly and transferred from public institutions and organizations,

- Reviews made in accordance with opinions and suggestions which have regulated intended for sectors that thought as risky by Tax Inspectors.

There is another audit type which functions intended for just one subject or upon denunciation, this is “investigation tax review”. Investigation review in article 142 of TPL, is expressed as a research which has made in case of finding signs which indicate tax evasion made by taxpayers in the result of denunciation and reviews in terms of this taxpayer or other related ones. In this type of investigation, the Magistrate must decide whether to search for the desired places and the examinations on the books and documents taken at the end of the search must be finalized within 3 months at the latest and returned with a record to the owner (PRA, 2007, p. 18).
In order to prevent unfounded denunciations, using audit power more productive, increasing effectiveness on tax enquiries, preventing occupation of administrative authorities unnecessarily and ensuring implementation unity, in scope of dated 16.02.2015 “Evaluation Comission of Denunciation and Review Demands (ECDRD) Regulation Regarding Working Affairs” documents has evaluated and in the result of evaluation decision types has determined and distributions of decision types which are taken with denunciation and review demands of evaluated documents on the base of decision types showed on Table 1 as following (Presidency of Tax Review Board, 2016, p. 66);

✓ Decision A: Making tax review,

✓ Decision B: Evaluating in scope of existing review duity,

✓ Decision C: Making preliminary review and research,

✓ Decision D: Directing persons whose transactions have concluded with common and intensive tax audits to relevant Presidency of Tax Office/Revenue Office,

✓ Decision E: Directing transactions to its relevant units,

✓ Decision F: Returning to its relevant units in order to make up deficiencies of review demands which has sent without any reason, containing sufficient information or document for tax review,

✓ Decision G: Memorizing and

✓ Decision H: Taxpayers who has dispatched to comission of explication evaluation.

<table>
<thead>
<tr>
<th>Year</th>
<th>Document Type</th>
<th>Document Quantity</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Ç</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Review Demand</td>
<td>69.396</td>
<td>174.139</td>
<td>2.975</td>
<td>445</td>
<td>1.444</td>
<td>461</td>
<td>13.015</td>
<td>914</td>
<td>66.045</td>
<td>--</td>
</tr>
<tr>
<td>2017</td>
<td>Denunciation</td>
<td>6.069</td>
<td>2.869</td>
<td>981</td>
<td>242</td>
<td>179</td>
<td>664</td>
<td>691</td>
<td>330</td>
<td>4.379</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Review Demand</td>
<td>84.150</td>
<td>121.297</td>
<td>2</td>
<td>304</td>
<td>560</td>
<td>459</td>
<td>13.020</td>
<td>1.565</td>
<td>165.557</td>
<td>7.041</td>
</tr>
</tbody>
</table>

| Note: Decision types are tax-based. Since more than one taxpayer may be present in the evaluated documents, the number of documents evaluated and the number of decisions are not equal.
The last type of audit is "collecting information" that is being carried out within the tax review process. In this type of audit TPL, gives authority to receive information to tax administration, from taxpayer, from third persons who make any transaction relevant with taxpayer, from public administration and institutions while carrying out researches regarding the taxpayers (Akdénéz, 2010, p. 61). In view of the fact that the tax examination can be carried out fairly and productively; it is also important that the tax base to be calculated on the tax receipt can be determined in full as well as the determination of the tax-causing event. It is very important to use the information collection facility for a fair and productive investigation. Because taxpayers who care about tax investigation and think that they can collect information from themselves and related real and legal entities can take care of the book registry and other, this process will be effective and efficiency will be ensured in taxation (Dogan, 2015, p. 68). The collection of tax revenues is made according to the declaration procedure generally given by the taxpayers in the Turkish tax system. However, taxpayers’ statements are in the form of ordinary profits and may be refuted as a result of examinations made by tax auditors even though they have the rightfulness of the presumption (Besel, 2017, p. 66). Therefore, it’s only possible to control the correctness of the statements by providing the necessary information continuously from the related taxpayers or related institutions. For this reason, it is very important that as a result of the tax audit to be carried out, the necessary information can be collected in order to prevent tax losses and evasions and to ensure the correctness of the taxpayer to be paid. These collected information will be evaluated by the tax administration and will ensure the tax audit system to continue in a better way (Samcı, 2016, p. 17). In 2017, 44,182 taxpayers were examined and the total amount of taxes required for taxpayers examined was 5,878,506,580 Turkish Liras, total amount of penalty (total of tax penalty, irregularity penalty and special irregularity penalty) was 14,370,585,724 Turkish Liras. In Graph 2, the number of taxpayers reviewed and the total tax amounts that requested assessment are included in the years 2013 – 2017.
The number of taxpayers reviewed and the total tax amounts that requested assessment followed a similar pattern. In other words, as the number of taxpayers examined increases, an increase is observed in the tax amounts requested. As the number of taxpayers examined decreases, there is a decrease in tax amounts requested. This situation indicates that an audit should be made on the taxpayers in order to increase the tax revenues.

**Relationship Between Audit And Collection**

Today, most of the taxes are based on declaration of taxpayers and audit of tax authorities. To ensure the accuracy of the tax bases declared by taxpayers mostly depends on the effectiveness of the tax audit. An effective tax audit is also an important factor in the success of the tax system. The fact that taxpayers declaring themselves by calculating their tax base brings to the agenda the necessity of the tax authorities to be strong and effective. Because, determining the persons who are hiding themselves from being taxpayer by revenue administration and auditing the correctness of taxpayers; declarations are necessary (Pehlivan, 1986, p. 33). There is a general consensus that the success of a tax system based on a declaration depends on the efficiency of the tax administration and the tax judge as well as the tax consciousness of the taxpayers. It is inevitable that the taxation of the taxpayers becomes irritating arbitrariness to the public and the aims to be achieved can not be carried out if the compliance of taxation based on the statements of the taxpayers can not be ensured by the tax administration and the tax judiciary effectively and rapidly (Akbay, 1982, p. 4). In addition to tax awareness and morality, one of the most important factors affecting tax collection is the efficiency of the structure of tax authorities and audit processes. Whatever the level of development and tax culture are, if there are no an efficient tax administration and tax audit process in an economy, informality will not be able to be brought to the desired level, tax collection will not reflect the potential, and eventually justice in taxation will not be have ensured. In this framework, it is very important to examine the structure and efficiency of tax administrations and the affects of tax audit on tax collection and justice in taxation (Akbey, 2014, p. 65). Regulations that are included in the tax system and are described as autocontrol methods are not always sufficient to ensure the tax safety. On the other hand, the functioning of the autocontrol methods effectively depends on the correctness of the declarations of taxpayers in the large scale. So auditing the accuracy of the tax base and the information declared by taxpayers are among the most important duties and authorities of the tax administrations. With this task and authorization, the tax administration is required to examine its accounts and transactions from time to time in order to ascertain the actual situation of the obligations of the obligation by means of the audit units it possesses against the tax laws. Because, without tax control, it is not possible to provide equality and justice in taxation with taxation based solely on statements of taxpayers (Savas, 2000).
It’s aimed with tax audits that taxpayers are required to follow tax laws and fulfill their obligations, as well as to increase the tax revenues collected. In this context, the relationship between the audit rates and the collected tax revenues is regarded as another measure showing effectiveness in audit. For example, according to Arslan & Binis (2014), the most basic purpose of providing efficiency in tax auditing is to increase tax revenues. In addition, the accrual collection rate is also important in evaluation of the institutional performance since it is also considered as a demonstration of the effectiveness of an administration (Acar & Merter, 2004, p. 21). The tax audit ratios and tax collection rates that show the effectiveness of the administration is given in Table 2.

<table>
<thead>
<tr>
<th>Year</th>
<th>Audit Ratio</th>
<th>Accrual / Collection Rate</th>
<th>Year</th>
<th>Audit Ratio</th>
<th>Accrual / Collection Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>4.75</td>
<td>92.2</td>
<td>2012</td>
<td>2.34</td>
<td>86.4</td>
</tr>
<tr>
<td>2007</td>
<td>5.75</td>
<td>91.1</td>
<td>2013</td>
<td>3.42</td>
<td>86.8</td>
</tr>
<tr>
<td>2008</td>
<td>4.82</td>
<td>89.7</td>
<td>2014</td>
<td>2.63</td>
<td>85.2</td>
</tr>
<tr>
<td>2009</td>
<td>2.06</td>
<td>87.4</td>
<td>2015</td>
<td>2.71</td>
<td>84.7</td>
</tr>
<tr>
<td>2010</td>
<td>0.36</td>
<td>86.2</td>
<td>2016</td>
<td>2.33</td>
<td>81.2</td>
</tr>
<tr>
<td>2011</td>
<td>1.22</td>
<td>85.6</td>
<td>2017</td>
<td>1.96</td>
<td>82.3</td>
</tr>
</tbody>
</table>

Source: The audit ratios were prepared by the author by using the activity reports of the PRA and the PTRB. The accrual / collection rate was obtained from the PRA Statistics page.

It is expected that the tax collection rate will be high in the years when the audit ratio is high, but this situation is not always valid. However, it seems that this situation has been realized in some years. While the audit rates tended to decline until 2012 when the Tax Audit Board’s annual report was published (except for 2007), accrual / collection rates also decreased constantly. With the start of Tax Audit Board activities, audit rates have increased significantly but there has been no increase in the accrual / collection rates and the rate has remained around 85%. The theory that the increase in audit rates will also increase the collection of tax revenues has not been realized according to these datas. Especially, it is noteworthy that the revenue ratio collected compared to the taxes accrued in 2016 is low.

**Expenditure Made For 100 Turkish Lira (TL) Tax Collection**

Adam Smith’s taxation principles are evaluated with this measure method in terms of efficiency, in the sense of being able to collect the maximum tax with minimum spending in the context of economic theory. If the expenditure made for 100 TL tax collection is low, it can be stated that the audit units work effectively and the tax revenues are effectively collected. It can say
that as the expenditure for collecting 100 TL tax decreases, efficiency in audit is provided. The amount of expenditures incurred by the revenue administration to collect 100 TL tax between 2006-2017 is given in Table 3.

Table 3: Expenditure Made For 100 TL Tax Collection

<table>
<thead>
<tr>
<th>Years</th>
<th>Tax Revenues</th>
<th>Income Administration Expenditures</th>
<th>Expenditure Made For 100 TL Tax Collection</th>
<th>Years</th>
<th>Tax Revenues</th>
<th>Income Administration Expenditures</th>
<th>Expenditure Made For 100 TL Tax Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>151,271,701</td>
<td>1,152,887</td>
<td>0.76</td>
<td>2012</td>
<td>317,218,619</td>
<td>2,179,670</td>
<td>0.69</td>
</tr>
<tr>
<td>2007</td>
<td>171,098,466</td>
<td>1,274,631</td>
<td>0.74</td>
<td>2013</td>
<td>367,517,727</td>
<td>2,095,646</td>
<td>0.57</td>
</tr>
<tr>
<td>2008</td>
<td>189,980,827</td>
<td>1,420,975</td>
<td>0.75</td>
<td>2014</td>
<td>401,683,956</td>
<td>2,313,804</td>
<td>0.58</td>
</tr>
<tr>
<td>2009</td>
<td>196,313,308</td>
<td>1,607,396</td>
<td>0.82</td>
<td>2015</td>
<td>464,886,790</td>
<td>2,453,350</td>
<td>0.53</td>
</tr>
<tr>
<td>2010</td>
<td>235,714,637</td>
<td>1,637,613</td>
<td>0.69</td>
<td>2016</td>
<td>529,263,765</td>
<td>2,859,874</td>
<td>0.54</td>
</tr>
<tr>
<td>2011</td>
<td>284,490,017</td>
<td>1,935,998</td>
<td>0.68</td>
<td>2017</td>
<td>625,512,314</td>
<td>3,091,677</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Note: Tax revenues figures are gross and include amounts of local government and fund shares, rejection and refunds. Amount of minimum subsistence reduction is include to income tax withholding amount in the tax revenues in 2008-2017.

Source: It was created by the author using data the Presidency of Revenue Administration

The efficiency of the audit can also be tracked by the drop in collection costs, that is, from the productivity increase. According to Chart 3 where the expenditure data for 100 TL tax collection in the last twelve years is presented, the lowest expenditure with 0.49 TL was carried out in 2017, the highest expenditure with 0.82 was carried out in 2009. In this context, it can be said that the highest activity in the last twelve years is 2017, while the lowest activity is 2009. In addition, with the effect of the establishment of the Tax Auditing Board, it is seen that the expenditure for collecting 100 TL tax since 2013 is below 0.60 TL and it tends to decrease compared to the previous years.

Literature Review

It has been showed that tax audits are more effective in increasing the voluntary compliance of taxation, especially if focused on selected taxpayer groups rather than randomly selected ones.

Loo (2006) noted that in an empirical study which carried out for undergraduate students in Malaysia, tax audits, tax rates, tax penalties, and tax structures have an impact on taxpayer
behavior. It has been inferenced that Tax penalty rates are the most important determinant of voluntary compliance of taxpayers.

Aytekin (2007) stated that the increase in tax revenues will be ensured in case of an increase in the quantity and nature of the tax review and the increase in the quantity and quantity of the tax review will make the auto control mechanism not only for taxpayers, but for the taxpayers in the business environment who are subject to the review. In this respect, the tax examination will not only increase the taxpayers’ statements, but will also increase the income they declare in their business environment through the auto control mechanism.

Badara (2012), by using the survey method analyzed by simple percentages, revealed that the tax authority exercises tax audit to obtain income, and tax audit reduces tax evasion problems.

Adediran, Alade & Oshode (2013) focused on the income generation impact of tax audit and investigation in Nigeria. By using the Pearson correlation coefficient, they found that tax audits and investigations could increase the government’s income base and at the same time reveal tax evasion incidents in the country.

Mutarindwa & Rutikanga (2014) have examined the affect of taxpayers; financial statements audit on tax revenues through surveys and tax records. They have shown that tax audit increases the compliance rate which will positively impact tax revenues in Rwanda.

Ladi & Henry (2015) investigated the relationship between tax audit and income generation through a survey, and noted that tax audit had importance and positive impacts on income generation and tax audit routinely needed to avoid tax evasion and excessive tax avoidance by taxpayers.

Mazzolini, Pagani & Santoro (2016) have examined the affect of audits on tax compliance in the context of 528,540 individual Italian taxpayers for the period 2007-2011. In the study, the behavior of audited taxpayers and unaudited taxpayers was compared and reported that annual reported tax revenues increased by an average of 6 percent for taxpayers audited instead of unaudited individuals. It was also pointed out that the positive effect of audits persists for four years and when the taxpayers are audited more intensively, the post-audit tax compliance will be higher.

Nwaiwu & Macgregor (2018) were analyzed with SPSS the impact of tax audit to tax revenue using 2000-2015 data, in scope of Port Harcourt and Lagos state. It’s determined that Nigeria’s tax audit has a positive effect on tax revenue generation and Nigeria has disclosed about 43.9% and 48.3% of the total variation in its tax revenues production. Also, because taxpayers do not disclose full income details to tax authorities, they found that retrospective tax audit to determine the amount of tax to be paid in previous years was a significant effect on personal income tax and corporate income tax. For this reason, they made inferences that tax auditing
had the potential to make a significant contribution to the tax revenue generation, and in order for the Nigerian government to increase tax revenues, in Nigeria they stated that regular tax audits should be carried out by the tax authorities.

### Econometric Analysis

Tax audit can find based on two criteria like ratio of number of taxpayers examined to total taxpayers and ratio of number of assessments to assessment declared (Juan, Lasheras ve Mayo, 1994, p. 92). In this study, the ratio of number of taxpayers examined to total taxpayers is considered. Also with this work, affects on tax collection of tax audit by using annual datas for 1984-2017 have examined. Tax audit ratios and tax collection data were obtained from the activity reports of Presidency of Revenue Administration and Presidency of Tax Review Board. In order to examine the affects tax collection of tax audit aquation 1 model is established. In aquation TR; represents tax collection, TA; represents tax audit. In this study, stationary of series; with ADF, PP, and KPSS tests, existence of causality relationships between varieties; with Toda-Yamamoto (1995) causality test, existence of the cointegration relation between the series Pesaran et al. (2001) by the boundary test method, long and short term analysis are also tested with ARDL approach.

\[
TR = \beta_0 + \beta_1 TA + u_t
\]

### Unit Root Analysis

Analyzes made with the non-stationary series involve a false regression problem and higher t and R² values are reached than which should be result of the analysis (Elder & Kennedy, 2001, p. 138). Findings obtained in the result of false regression cause misleading interpretations. Stability analyzes began with the work of Dickey and Fuller in 1979 and 1981. The unit root problem, which means that the average and variance of the series change systematically over time, so this leads to deviations in the analyzes. Stability means that serie is not affected by its past values. In this study, series included in the analysis were subjected to the unit root test and the stationarity of the series were checked. For this purpose, the extended Dickey-Fuller (ADF) (1981), Philips-Perron (PP) (1989), which is stronger than the ADF test in trend series, and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) (1992) unit root tests that are null hypothesis is opposite to ADF and PP tests were used and the results are presented in the Table 4.
Table 4: Unit Root Test Results

<table>
<thead>
<tr>
<th>Series</th>
<th>ADF t-statistic</th>
<th>Prob.</th>
<th>PP t-statistic</th>
<th>Prob.</th>
<th>KPSS LM-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA</td>
<td>-4.11*</td>
<td>0.003</td>
<td>-4.05*</td>
<td>0.003</td>
<td>0.11*</td>
</tr>
<tr>
<td>TR</td>
<td>-2.27</td>
<td>0.185</td>
<td>-1.70</td>
<td>0.420</td>
<td>0.94</td>
</tr>
<tr>
<td>ΔTR</td>
<td>-3.66**</td>
<td>0.043</td>
<td>-5.89*</td>
<td>0.000</td>
<td>0.41*</td>
</tr>
</tbody>
</table>

Note: * and ** indicate significance levels of 1% and 5%, respectively, and Δ denotes the series that difference is taken.

The hypotheses in the ADF and PP unit root test for stable stationarity analysis of the series are set as follows. The KPSS unit root test is the inverse of the hypotheses used for the ADF and PP tests because it is the test validity of ADF and PP tests.

H0: δ = 0 does not contain unit root, serie is stationary.

H1: δ ≠ 0 contains unit root, serie is not stationary.

According to the unit root test results; the tax audit series is stable in the level values when the results of three different tests are jointly evaluated and the tax collection is not stationary in the level values and becomes stationary when the difference is taken. Therefore, the tax audit series is I(0) while the tax collection is I(1).

Causality Analysis

Regression analysis examines dependence relationships between variables, whereas causality relationship is not examined in these analyzes (Bagdigen & Beser, 2009, p. 9). For this reason, economic variables have to be related to each other in the long run, which does not mean the existence of causality relation between these variables (Gujarati & Porter, 2009, p. 652). The concept of causality is important to determine the existence and direction of the relationship between economic variables. Causality; it is a concept that must be taken into consideration in the policy making process in order to find out whether one of the analyzed series has an effect on the values of the other over time or not. In the Granger (1969) causality test, while the series should be stationary, the causality test developed by Toda-Yamamoto (1995) abolished this requirement. The Toda-Yamamoto (1995) test ensures to contain more information using the level value of the non-stationary series, and is thus able to produce more successful results than the Granger (1969) test (Gerede, 2016, p. 60). The Toda-Yamamoto (1995) causality test was applied, not the Granger (1969) causality test, since the series were not stable at the same level in the study. For Toda-Yamamoto (1995) causality analysis, which we will describe as an improved Granger causality test, first a VAR model is established and optimum delay length (k) is determined. In addition, the maximum integration levels of the variables in the model
are also determined by the unit root test ($d_{\text{max}}$). Toda-Yamamoto (1995) test was applied by adding the improved VAR model with delay ($k + d_{\text{max}}$) after determining the maximum integration level ($d_{\text{max}}$) and optimal delay length ($k$) of the variables (Terzi & Yurtkuran, 2016, p. 16). Test results are presented in Table 5. For causality tests, it is extremely important to determine the delay length. Because acceptance of a lower delay length than is necessary, it causes false causality (Cetin & Seker, 2013, p. 132).

### Table 5: Toda-Yamamoto Test Results

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Chi-sq</th>
<th>df</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax Audit</td>
<td>Tax Collection</td>
<td>7.37</td>
<td>2</td>
<td>0.02*</td>
</tr>
<tr>
<td></td>
<td>Tax Audit</td>
<td>7.37</td>
<td>2</td>
<td>0.02*</td>
</tr>
</tbody>
</table>

Note: The optimum delay length is set to 1, taking into account the LR (Sequential Modified LR Test) and SC (Schwarz Criterion) criterions. Since $d_{\text{max}} = 1$, the Wald test was applied based on $k + d_{\text{max}} = 2$ delay length *, which represents a level of significance of 5%.

According to the results of the Toda-Yamamoto causality test, the one-way causality relationship from the tax audit to the tax collection (because the probability value is less than 0.05) has been identified.

### Cointegration Analysis

Engle-Granger (1987), Johansen (1988, 1991) and Johansen-Juselius (1990) cointegration tests can be applied to determine if there is a long-term relationship between the series if all of the series are stationary at the same order. If the stationary levels of the series are different, ARDL (Autoregressive-Distributed Lag) bounds testing method developed by Pesaran and Shin (1995, 1999), Pesaran and Smith (1998) and Pesaran, Shin & Smith (2001) is used. The ARDL approach allows examining the cointegration relationship if the explanatory variables are stationary at different levels such as level I(0) and first difference I(1). As it will be seen in the analysis section, it was determined that the variables included in the study were stationary at different levels, so the ARDL-Bounds testing method was used for this study. Hypotheses to test for the existence of cointegration relationship between the series;

$H_0 : \gamma_1 = \gamma_2 = \gamma_3 = \ldots = \gamma_n = 0$ (No cointegration)) and

$H_1 : \gamma_1 = \gamma_2 = \gamma_3 = \ldots = \gamma_n \neq 0$ (There is cointegration),

Bounds testing cointegration results are shown in Table 6.
The fact that the calculated F-statistic value is above the critical upper limit indicates that there is a cointegration relationship between the series, and below the critical lower limit indicates there is no cointegration relationship between the series. There is no definite judgment on cointegration when the calculated F-statistic is between the lower and upper bounds (Dogru, 2014, p. 26). The H0 hypothesis was rejected because the calculated F-statistic in the chart is higher than the upper critical values. This result reveals that there is a long-term cointegration relationship with at least 5% error level among the variables we are dealing with. In addition, the diagnostic test results of the ARDL model are given in Chart 6. Accordingly, since the probability values are larger than 0.05 in all tests, it is understood that the model does not have any autocorrelation (Breusch-Godfrey LM Test), changing variables (ARCH LM Test) problem, error term has normal distribution (Jarque-Bera Normality Test) and model setup error (Ramsey Reset Test).

**Long Term Analysis**

Because of the existence of a long-term relationship between the variables according to the bounds testing result, a long-term analysis, the second stage of the ARDL process, was carried out and the results are given in Table 7.
Table 7: ARDL Approach Long and Short Term Coefficients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Long Term Coefficient</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax Collection</td>
<td>0.084</td>
<td>0.117</td>
<td>2.722</td>
<td>0.047</td>
</tr>
<tr>
<td>C</td>
<td>10.362</td>
<td>1.767</td>
<td>5.861</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Short Term Coefficient</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax Collection</td>
<td>-2.053</td>
<td>0.848</td>
<td>-2.419</td>
<td>0.022</td>
</tr>
<tr>
<td>Tax Collection (-1)</td>
<td>1.549</td>
<td>0.914</td>
<td>1.693</td>
<td>0.102</td>
</tr>
<tr>
<td>CointEq (-1)</td>
<td>-0.711</td>
<td>0.182</td>
<td>-3.898</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Diagnostic Tests</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R² (0.71)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARCH LM (0.61)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breusch-Godfrey LM (0.91)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramsey Reset (0.80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jarque-Bera Normality (0.08)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The CointEq (-1) variable is a delayed value of series of error terms obtained from the long-term relationship.

According to the information in Table 7, since the probability values in all tests are larger than 0.05, it is understood that the model does not have any autocorrelation (Breusch-Godfrey LM Test), changing variable (ARCH LM Test) problem, error term has normal distribution (Jarque-Bera Normality Test) and model setup error (Ramsey Reset Test). The results in the table show that there is a long-term meaningful relationship between tax audit and tax collection. As a matter of fact, when tax audit increases by 1%, tax collection increases by 8.4%. This result shows that tax audit has an important place in increasing tax collection. In the short term analysis, the error term has a negative coefficient (-0.711) and statistically significant. That is to say, the error correction model is working and about 71% of 1 unit deviation is recovering after a period. This shortage of imbalances in the short term is closing in this way. This means that the short-term deviations of the cointegrated series will rise after a certain period of time and again converge to the long-term equilibrium value of the series. This expresses that the results of our long-term analysis are reliable. As a result of the analysis, the effect of the tax audit on tax collection was found to be consistent with the work of Adediran, etc. (2013), Ladi and Henry (2015), Mazzolini, etc. (2016) and Nwaiwu and Macgregor (2018).

**Conclusion**

In order to carry out services which are existence cause for governments, revenues are necessary for meeting services. Most important one of these revenues is tax revenues. Tax does not like by individuals and people for the reason that it decreases their available incomes and also seen as a burden. Taxpayers, in case of not being tax audit or being inefficient and knowing that have an
opportunity to abstain from tax liabilities, will not be willing to pay taxes. So, tax audit is an important tool for government ensuring taxpayers to pay their taxes. But in Turkey, tax audit is regarded as a control after tax evasion, tax loss and tax irregularity events rather than proactive audit. Since the current audit is not carried out, the audit is carried out after the registered transactions of taxpayers and now to little too late for taxpayers. For this reason, most of time is exposed to high penalties. In this instance, the perception that taxpayers are punishing because of these audits are postponed deliberately and main purpose is not to supervise, to prevent or to guide. Therefore, in order for the tax audit to be effective, the audit must be done routinely before making the mistake. A supreme board can establish that will cover all audit institutions in our country, provide coordination among these institutions, provide solutions to audit problems, organize audit related scientific meetings, and establish a senior committee to closely monitor international developments in this subject. The efficiency of the operation can be kept up to date by evaluating the performance of the tax offices at certain intervals. It can be ensured that tax offices are in a structure which can provide all informations required by audit staffs as complete and in time. Also it may be possible for the tax offices to establish one-to-one relationship with the taxpayer so that it can be ensured to direct on taxpayer-focused audit at least. Taxpayer-focused understanding can be provided to each of units includig the tax offices. A taxpayer-focused audit may be provided by presenting a statement booklet on the taxpayer’s rights and obligations when starting tax review. Once all this has been done, confidence in the tax system will be increased thanks to the increase in tax audit and regular tax revenues will be gained. In this study, the affects of the increase in the tax audit between 1984 and 2017 on short and long term total tax collections by means of the ARDL bounds testing approach because the series were stable at the level and first different levels. As a result of analysis, a positive relationship was found between tax audit and tax collection. When tax review increases by 1%, tax collection increases by about 8%. Namely, tax audit constitutes one of the methods of increasing tax collection. Therefore, government that want to increase tax collection should attach importance to tax audit. However, these audits should be carried out in accordance with the objectives of the audit. That is to say, during tax audit, taxpayer should be given the feeling that there is also the educational feature of tax audit.
References


THE RELATIONSHIP BETWEEN TAX AUDIT AND TAX COLLECTION IN TURKEY:
ARDL BOUNDS TESTING APPROACH
Huseyin KUTBAY


1. Introduction

The 2nd article of 1982 Constitution Act describes Turkish Republic as a social law state. Therefore, it is a must for the state to carry out certain activities for ensuring public services. The state to fulfill its duties within the scope of social state principles requires a certain part of special resources to be transmitted to the state, itself. The most important tool that is used for meeting the expenses of public activities is the taxes (Kaneti, 1986/1987, p. 3). In other words, the state imposes taxation for obtaining the financial resources that are required for providing services.

In accordance with the 73rd article of the Constitution, with the title “Tax Duty”, taxes, duties, charges and suchlike financial liabilities are protected, amended or revoked by law. Enforcement of tax laws, as well as assessment, accrual and collection transactions are carried out by the tax offices in order to constitute administrative actions and procedures. Administrative procedures final and obligatory legal transactions that legally result in with unilateral declaration of intention within the framework of administrative law in the administrative activities of administrative bodies and authorities. Administrative actions, on the other hand, is when the administration is inactive with the operations, actions, processes and studies in the physical area having no administrative resolution or procedure on its basis. Despite the fact that the administrative procedures reflect the declarations of intension that lead to changes and innovations in law, the administrative actions, with no changes and innovations in law, may lead legal impacts and consequences provided only those related are entitled to use their rights and Powers (T.R. State Council Dept. No.: 10, 2008). Notwithstanding that the taxpayers calculate the tax to be paid based on declaration, this is not recognized as an assessment. The assessment procedure is to be carried out by the respective tax office (Tosuner & Arikan, 2018, p. 235). Hence, Tax Procedures Law clearly prescribes that assessment process is an administrative procedures. So the administrative procedure factors are applicable on the taxation procedures in the same manner (Tosuner & Arikan, 2017, p. 5).
Therefore, the taxation procedures lead to a relationship of payable – receivable between the state and individuals. This situation encumbers responsibility on both sides. The states it the tax claimant, while the taxpayers are the tax debtors. The duties that are requested from the taxpayers are generally specified within the scope of periods in the respective tax laws. The periods are prescribed by law for procedures like declaration, notice and payment periods. The period for a specific tax is prescribed in that tax law. The periods that are related to more than one tax and form are regulated in Tax Procedure Law (Özyer, 2001, p. 55).

2. The Term “Duration (Term)” In General

In the lexical meaning, time refers to the period, during which an event or action has occurred/ will occur, to a part of specific period, or a specific moment. Time also has a meaning that involves the definition of “period”. The term “duration (term)”, in the lexical meaning is described as the frame, interval, time and period from the beginning to ending of an event (Turkish Language Society, 2018). The terms are the periods that are specifically limited or pre-determinable (Öncel, Kumrulu, & Çağan, 2008, p. 109). In other words, it is the period of time that is specified for any procedure, with a beginning and ending. Additionally, there are also terms that end up until to or start from a certain time. Within this scope, the time and term may sometimes be used under the same context. Since the rights and debts are based on terms under certain circumstances and used within certain periods, terms are more significant compared to time in law (Yılmaz, 2014, p. 3167).

Term, in terms of Tax Law, is the period of time specified to fulfill the liabilities and to exercise the rights within the taxation process. As in all the areas of law, terms are of great importance in tax law, as well. As the administration fulfills its duties and exercises its powers, it acts within the scope of prescribed rules and principles. Being aware of the beginning and ending of terms in tax law, including its legal characteristic and consequences are of crucial importance both for law enforcement officers and taxpayers with regards to ensuring and maintaining the public order in tax law. Terms that are binding upon both the taxpayers and the administration are prescribed for each and every phase of taxation process in tax law (assessment, notification, accrual and collection) and prosecution process. Where these procedures are remediable, the prosecution processes are based on various terms, as well (Kızılot, Şenyüz, Taş, & Dönmez, 2007, p. 173). Tax administration is liable to fulfill the taxation procedures within the prescribed terms. On that sense, the terms constitute an assurance for taxpayers against the tax administration. Similarly, the taxpayers are required to exercise the entitled rights and fulfill their duties as prescribed by law within these specified durations. Otherwise, the consequences may sometimes go against the taxpayer.
3. Classification of Terms

The numbers of provisions for terms are relatively high concerning the powers of the state, as the tax claimant, as well as the rights and duties of taxpayers and tax responsible parties, in tax law. These provisions may sometimes be oriented at substantive or adjective tax law. The provisions of term with regards to substantive tax law are the ones that directly affect the basis of tax debt. On the other hand, the provisions of term with regards to adjective tax law involve those related to tax procedural and enforcement laws, in addition to the ones regulating the tax procedures (Tosuner & Arıkan, 2017, pp. 136-137). Considering their legal and common characteristics, these provisions of term are classified under two groups. The classification made by the state organ that prescribes the terms is the classification by organs. The classification of terms that is made as per the legal characteristics comprises of latest terms, prescription periods, terms that are related to tax duties, tolerated terms and regulatory terms (Şenyüz, Yüce, & Gerçek, 2015, p. 202).

<table>
<thead>
<tr>
<th>Classification of Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on Organs</td>
</tr>
<tr>
<td>Legal Terms</td>
</tr>
</tbody>
</table>

The terms that are subjected to various classifications are not only specified by the legislative & judicial organs, but also by the administration. The terms that are valid in tax law are prescribed by law, in general. Prescribing the terms by tax laws is based on the principle of legality in taxation and the clarity of tax (Öz, 2004, p. 109). Since the taxpayers lose certain rights where the prescribed terms are not complied, the terms in tax law are generally final terms.

3.1. Terms in terms of Organic Classification

This classification is made taking the state organ that determines the respective terms into consideration. The terms in tax law may be prescribed by the legislative, executive or judicial organs. Terms are categorized under three groups in line with these organs: legal terms, administrative terms and judicial terms.

3.1.1. Legal Terms

The terms that are prescribed by law, with certain beginning and ending, not requiring nor based on a certain intention are the final terms. According to Tax Procedure Law No.: 213, Article: 14, the terms are prescribed by tax law in tax transactions. In line with the provision of this article, the regulations of terms in tax law have been made with this law. According to
Article: 168 of the same law, the notifications for employment are to be made within ten days after the employment date. This provision is applicable to all taxpayers. However, the regulations for terms are not limited to the provisions of Tax Procedure Law. In addition to the terms regulated by this law, there are provisions for terms in other tax laws, as well. For example, the taxpayers, whose incomes are designated as per the real taxation, are to submit their tax assessments until the end of 25th day of March in the following year, according to the Income Tax Law, Article: 92. As can be understood by the foregoing, the legal terms can be categorized under two groups as general and special terms. While the general terms are included with regards to the taxes in Tax Procedure Law (in terms of administrative procedure) and Administration Jurisdiction Procedure Law (in terms of general administrative procedure), the tax laws comprise of the terms with regards to that specific tax or relationship (Kızılot et al., 2007, p. 174).

In legal terms, the time elapses by itself. There is no requirement to give a notification to the liable by law (Kaneti, 1986/1987, p. 88). These terms are recognized as ex-officio by the administrative and judicial organs. It is not applicable to change, extend or shorten the terms by the administrative and judicial organs apart from the situations that are clearly prescribed in law.

3.1.2. Administrative Terms

In administrative terms, the law prescribes that a certain procedure or action is based on the term, with no specific duration. The law maker, prescribing that it is not possible to regulate any matter by law, authorizes the administration for procedures, which cannot be regulated within the scope of term. In other words, the law does not directly prescribe the duration, but rather leaves it up to the discretion of administration. The general provisions with regards to administrative terms are included in the Tax Procedure Law, Article: 14. According to the provision of this article, the term for procedures with regards to tax transactions shall be prescribed by the notifying administration provided it is not less than fifteen days and taxpayer is notified, for matters that are not clearly prescribed by law. As can be clearly seen, this is the basis of administrative terms. Under such circumstances, the administration cannot create the term by itself. It just engages the term, of which limitations are prescribed by law (Şenyüz et al., 2015, p. 203). Despite having a lower limit of fifteen days for the terms by law, there is no upper limit. However, the law prescribes limitation for the terms that can be stipulated by the administration for certain circumstances. For example, according to the Tax Procedure Law, Article: 17, the Ministry of Finance and Treasury Department may grant an extension of time that is equal to one time more up of the legal term, and not exceeding one month, where the legal term is less than one month, for those who are not able to fulfill their duties with regards to tax transactions for being under challenging circumstances. According to the 28th article of the same law, Revenue Administration is authorized to re-prescribe the terms for issuing the declaration and making the payment in a manner not exceeding one month after the legal term.
The administrative terms are applied where the administration requires information and document for completing the tax transaction and the term is not clearly prescribed by law (Tosuner & Arıkan, 2017, p. 138). For example, according to the Tax Procedure Law, Article: 30, in the event that the taxpayers submit the tax returns within the legal or collateral extension, yet not indicating the information for tax assessment, an extension of time is granted to them, not less than fifteen days by the valuation commission, thus being requested to submit the respective information and legal books.

3.1.3. Judicial Terms

In terms of tax law, the judicial terms are defined as the terms that are prescribed by the judicial organs. In the regulation made with regards to the terms in Tax Procedure Law, Article: 14, it is only the legal and administrative terms that are under judgment. On the other hand, it is prescribed in the Administrative Jurisdiction Procedures Law that the terms for settlement of disputes, arising out of taxation transactions, may be prescribed by the tax judicial organs. According to Article: 16 of this law, the time is granted for the prosecution to respond to the defense by the defendant in administrative and tax lawsuits (Öncel et al., 2008, p. 111).

These terms as prescribed by the judges during the proceeding are of the same characteristics with the administrative terms. The term is not clearly stated in the judicial terms, as in the administrative terms. In addition, there is no lower nor upper limit for the judicial terms in law, unlike the administrative terms. The judge decides the procedure to be carried out or completed within a certain period of time. The judicial terms are to be notified to related persons, with regards to notifying the parties.

3.2. Legal Characteristics of Terms

The terms can be classified as per their legal characteristics within the scope of tax law. For this classification, the legal consequences and the sanctions to be applied are to be taken into consideration, where the terms are not violated.

3.2.1. Final Terms

In a broad sense, the final terms is the indisputably final period granted by law or court for exercising a legal right, where the right is not exercisable in the event granted term is over for that specific right (Berki, 1968, p. 101). In other words, where the right cannot be exercised for expiration, it is called the final term. Final terms start lapsing from a specific time point as prescribed by law and end in a specific time point in the same manner (Karakoç, 2004, p. 239). In the event the right for the term of litigation in a tax court, which is 30 days in legal
terms is not used in time, it leads losing the right of bringing action, while being recognized as the final term, as well (Bilici, 2005, p. 79).

3.2.2. Prescription Periods

Prescription can be described as the claimant losing the right to claim or bring action for not doing so in time as prescribed by law and due time of a receivable (Erginay, 1988, p. 93). According to Tax Procedure Law, Article 113, the prescription is the invalidation of tax receivable for lapse of time. The term “prescription” used in tax law has a similar context with the one in the law of obligations, yet it differs in one aspect. According to the Law of Obligations, Article: 154, while the prescription is a plea, which is to be claimed by the debtor, it takes effect regardless of whether the taxpayer lodged as application in this matter, or not. In other words, prescription, in terms of law of obligations, cannot be considered by the judge, unless it is claimed. However, the prescription is considered as ex-officio since it eliminates the tax claim in terms of tax law (Kaneti, 1986/1987, p. 124). The main reason for recognizing the prescription in tax law is the public interest, as in private law. The prescription is not oriented at punishing the claimant in legal terms (Öncel et al., 2008, p. 132).

There are two kinds of prescriptions in terms of the original and penalty in tax law. The subtypes of these categories are accrual prescription and collecting prescription in terms of original tax, and penalty prescription and fine collecting prescription in terms of penalty (Kirbaş, 2003, p. 146). According to the Tax Procedure Law, Article: 114, the taxes that are not notified to the assessment and the tax payer within five years starting from the arising calendar date of tax claim are subjected to assessment (accrual) prescription. Prescription in penalties is involved in the assessment prescription, as well (Oktar, 2011, p. 134). According to Article: 374 of the same law, the prescription periods in penalties are as follows: five years starting from the first day of the following calendar year, when the fined tax claim arose, within the scope of loss of tax; five years starting from the first day of the following calendar year, when the irregularity is made, within the scope of special irregularity penalties; and two years starting from the first of the following calendar year, when the irregularity is made, within the scope of irregularity. Prescription of collection is regulated within the scope of Law on Collection Procedure of Assets, Article: 102. According to the provision of this article, the collection procedure of assets is subjected to prescription, where it is not collected within five years starting from the following calendar year after the due calendar year. The taxpayers are allowed to pay the tax that is subjected to prescription. On the other hand, not claiming the accrual prescription of a tax by the taxpayer does not render the tax collectable. This detail is to be taken into consideration by the administration as ex-officio (Tosuner & Arikan, 2017, p. 127).
3.2.3. Terms in Tax Duties

These are the terms that are prescribed for fulfilling the liabilities by the tax laws, particularly the Tax Procedure Law. These terms are similar to final terms with regards to their legal consequences. Where the tax duties are not fulfilled in prescribed terms, various sanctions may be applied for each event. For example, it is a must for the nonexempt tradesmen and handycraftsmen to notify the tax office, within ten days after starting to do business. Those who do not notify the tax office in time are subjected to the provisions of irregularity penalty. They may be subjected to ex-officio tax assessment for not submitting declaration. They may even be subjected to penalty of tax loss.

3.2.4. Tolerated Period of Time

One of the terms that is regulated for taxpayers and tax responsible parties is the tolerated period of time in Tax Procedure Law. These terms are applied for taxpayers that could not fulfill their duties in good will within the prescribed period of time due to certain reasons. The terms that are prescribed in the 371st and 376th article of the same law can be cited as examples for these terms. Where the taxpayers, committing acts that are subjected to penalty of tax loss for declaration based taxes, inform the respective authorities on this violation by themselves are not subjected to tax loss penalty according to the provisions of Article: 371. In order to benefit from these provisions, it is a must for the outstanding tax declarations to be submitted within fifteen days starting from the receipt date of notification petition by the taxpayer, along with meeting the other requirements, as well as correcting or completing the missing or incorrect tax returns, and paying the outstanding taxes including the repentance interest.

In the event that the taxpayer or tax responsible party, subjected to tax penalty, with regards to the additional, ex-officio taxes, including those accrued by the administration, informs the tax office for undertaking to make the payment within thirty days starting from the receipt day of notifications within the due period of penalty, or within three months starting from the maturity date by presenting a security as specified in the law no.: 6183, a discount is applied by 50% on the first time within the scope of tax loss penalty, 1/3 for those deducted after, while 50% on irregularity or special irregularity penalties.

In order to benefit from the tolerated periods of time, certain procedures are to be completed within the terms as prescribed by law. As long as these terms are not followed, the right to benefit from repentance and fine remission is taken away. In this sense, the tolerated periods of time are recognized as final terms (Öncel et al., 2008, p. 114).
3.2.5. Regulatory Terms

Regulatory terms are described as the terms that are to be complied by the tax offices and judicial organs for their transactions. These terms are related to the taxation procedures (Şenyüz et al., 2015, p. 211). For example, according to the Tax Procedure Law, Article: 132, the first copy of the inspection forms is submitted to the inspected or authorized person. These are mailed to the known address within 7 days. The difference between the regulatory terms and other terms is that there is no sanction (Öncel et al., 2008, p. 114). In other words, it is not prescribed by law what to do and what the sanction would on the administration, where the terms are not followed.

4. Calculations of Terms

The general principles for calculating the terms that are prescribed in the tax laws are set out in Tax Procedure Law, Article: 18. These principles vary based on whether these terms are assigned as daily, weekly, monthly or to a certain day.

Where the term is set forth as daily basis in the tax laws, the starting day is not counted. This term ends on the last day at the close of business. In the event that the term is set forth as weekly or monthly basis, it ends on the corresponding date of the week or month, at the close of business. During the deadline month, where there is no day corresponding with the starting day, the term ends on the last day of that month, at the close of business. For terms, of which deadline is specified with a certain day, the term ends by that day, at the close of business. Official holidays are included in the term. Where the last day of the term coincides with an official holiday, the term ends on the following business day, at the close of business.

Law on Collection Procedure of Assets, Article: 8 refers to the Tax Procedure Law, Article: 18, with regards to the calculation of these terms. In this manner, unless otherwise is stipulated within the scope of the terms that are prescribed with this law with regards to the forced collection of tax claims, the principles of Tax Procedure Law are applicable for calculation of terms. The terms that are applied on the judicial stage of taxation process are calculated in accordance with the principles that are stipulated in Administrative Jurisdiction Procedures Law no.: 2577, Article: 8. According to this, the terms start in the following date of notification, publishing or declaration. The holidays are included in the terms. Where the term coincides with a non-working day (holiday), it is extended until the end of following day, to the close of business. In the event that end of written terms coincide with the non-working days (20th July – 31st August), these terms are recognized to be extended for seven days, starting from the following day after the end of non-working day.
5. Time Extensions

Tax Laws stipulates extension of time under certain particular situations. The terms that are granted to the taxpayers may be extended in case of force majeure, challenging conditions, ex-officio extension by the Ministry of Finance and Department of Treasury, and death. Additionally, certain legal periods are also subjected to extension, within the scope of taxation due to financial and judiciary recesses (Öner, 2014, p. 101).

5.1. Force Majeure

The term “Force Majeure” is a common concept of various fields of law. In general, the events that occur as non-intentional and which cannot be prevented are recognized as force majeure. These events can be summarized as such natural events like earthquake, flood, hurricane, etc., as well as human activities like revolt, revolution, war, general strike. Having an external-based characteristic, the force majeure leads those suffering from itself to critical problems, challenges and mostly even impracticability. It may be not possible for taxpayers to fulfill their tax duties under such extraordinary situations. In such cases, the law postpones the duties of taxpayers until the extraordinary situation ends and the assessment prescription is extended for the period of extension, as well (Özyer, 2001, p. 44). Exercising up of a right, which could not be exercised due to force majeure or an unexpected event, is one of the general principles of law (Karakoç, 2004, p. 253).

5.1.1. Force Majeure

The definition of force majeure is not included in Tax Procedure Law, but instead, it is described under the suchlike extraordinary situations that are recognized as force majeure in Article: 13. The force majeure listed in this article are as follows:

- Any severe accident, disease and custody on a level preventing any tax duty to be fulfilled;
- Natural disasters like fire, earthquake and flood that prevent the tax duties from being fulfilled;
- Absences that non-intentionally occur;
- The books and papers to be non-intentionally out of the owner’s control.

The law-maker has showed a flexible approach by stating the respective situations as “suchlike” in order to recognize some other events as force majeure, as well (Orhan, 1986). However, force majeure is not the events that are infinite, but rather those that are recognized to be temporary. In order for any event to be recognized as force majeure, it is a must for the related person to
have no negligence, the event to occur suddenly, to related person not having the ability to prevent the event from occurring, while preventing him/her from fulfilling his/her tax duties (Tosuner & Arıkan, Vergi Usul Hukuku, 2017, p. 144), as well as having a causal relation between the force majeure and the respective terms. Specific events are not to be pre-recognized as absolute force majeure, and each event is to be evaluated on an individual bases within the scope of its conditions and characteristics (Öncel et al., p. 118).

5.1.1.1. Severe Diseases and Accidents
Where the taxpayers cannot fulfill their duties due to suffering from a severe disease or having a severe accident, which prevents them from doing so, this is recognized as a force majeure in terms of tax law. Such event to be recognized as force majeure is to be evidenced with a medical certificate to be obtained from the hospitals claiming it (Ministry of Finance, General Directorate of Revenues, 2004). The force majeure, in case of a severe disease, is recognized to end at the end of sick leave period. In case of a severe accident, the date when the taxpayer recovers from the effects of accident. Where a person, who cannot do business following a severe accident, assigns a public or legal representative, the force majeure is recognized to be ended (Tosuner & Arıkan, 2017, p. 145).

5.1.1.2. Custody
It is possible for the taxpayers not having the ability to fulfill their duties in time due to the decisions taken by the judicial organs. Custody would be sited as an example for this matter. The provisions that are related to custody are regulated within the scope of Code of Criminal Procedure no.: 5271, Article: 100 and following articles. Custody is not a penalty by itself, but a preliminary measure that is applied under exceptional situations. The decision to take the suspect under custody during the investigation by the criminal court judge after being requested by the Public Prosecutor, and during the prosecution process by the request of Public Prosecutor or ex-officio court. The detention is recognized to be a force majeure, provided it is evidenced by the taxpayers, according to Tax Procedure Law, Article: 13.

5.1.1.3. Natural Disasters
Natural events that occur within a short period of time, cannot be prevented by people, as well as causing loss of life and property are called disasters. The locations where the disasters occur the most are known to humanity. For example, the outcomes of disasters like earthquake, landslide, snowslide, flood, frost, etc., are directly and instantly experienced. However, the outcomes of others like drought are felt indirectly and after a long time (T.R. Ministry of Interior, 2018). According to Tax Procedure Law, Article: 13; fire, earthquake and inundation are
recognized as natural disasters. The natural disasters, which are recognized as force majeure, are not limited to foregoing. Despite being described as inundation by law, flood is also recognized as a natural disaster. Similarly, earthquake is not limited to itself, but includes snowslide, landslide, as well. On the other hand, frost, drought, vermin/insect infestation are not recognized as force majeure, due to not preventing the tax duties from being fulfilled (Özyer, 2001, p. 46).

It is characteristic feature of disasters to affect and cause damage on more than one person. Where it is only one person who is exposed to natural disaster, it is the taxpayer’s duty to prove and certify that the natural disaster occurred and prevented him/her from fulfilling his/her duties. The natural disasters to occur in a whole or a partial section of a certain region, and the residents of that region to be affected by it, do not require any additional certificate or evidence document. According to the Tax Procedure Law, not all of those, who are exposed to natural disasters, but only those are prevented from fulfilling their tax duties due to the disasters are entitled to benefit from the force majeure act. For example, a fire, which affected only a small part of a work place and not causing any damage on accounting department, is not recognized as a force majeure.

5.1.1.4. Non-intentional Obligatory Absence

If the taxpayers cannot fulfill their tax-related duties due to unintentional absence, this situation is recognized as force majeure. For example, where a person is kidnapped for ransom and held hostage for a long time, it is recognized as a non-intentional obligatory absence. This situation, which prevents the related person from fulfilling his/her tax-related duties, is recognized as a force majeure, provided that it is evidenced by the taxpayer. Obligatory absences are not limited to kidnaps. A person, whose plane is hijacked during his/her travel, who is stranded due to snow, blizzard, collapsing of a tunnel, etc., thus being prevented from fulfilling his/her tax-related duties is recognized within non-intentional obligatory absence, as well.

5.1.1.5. The Books and Paper that are non-intentionally out of the owner’s control

The books and papers being non-intentionally out of the owner’s control are caused by robbery. Getting the books and papers stolen in civil and criminal jurisdiction is recognized within the scope of force majeure, as well (Özyer, 2001, p. 47). In such case, it must be certified according to the Turkish Trade Code, Article: 82. Seizing of the books, papers by official authorities and courts is not recognized as force majeure, where it is allowed by the taxpayer to do so (Tosuner & Arıkan, 2017, p. 148).
5.1.2. Outcomes of Force Majeure

Force majeure is applicable for taxpayers, tax responsible parties and legal representatives. Even if the force majeure that is directed to the close relatives of taxpayers and tax responsible parties prevents them from fulfilling their tax duties in time, this is not recognized as a force majeure (Öncel et al., 2008, p. 120). The force majeure to be recognized for only one representative in case of more than one representative for legal entities cannot be claimed for legal entities where the duties can be fulfilled by others. The tax office is the authorized body to make the final decision whether an even is force majeure, or not. In order for the provisions of force majeure to be applied, they must be adopted by the tax office, while the force majeure is to be proven or certified by those claiming the force majeure.

Force majeure does not have a direct effect on tax-related matters, but rather, it does have an effect on the fulfillment of tax duties after the event that leads to tax burden. In other words, it does not affect the creation of tax liability, but affects the duties that are related to the existing taxes to be fulfilled. Similarly, it does not prevent the tax liabilities to be paid, while postponing the fulfillment of tax related duties. The term for paying the taxes, of which tax return periods coincide with the force majeure, is postponed according to Tax Procedure Law, Article: 111. No late fee is imposed under such circumstances, nor making an installment plan (Ünel, 2007, p. 108). However, the payment term of taxes that were accrued before the force majeure is not postponed. After the tax is accrued, it is recognized as public receivables, and the provisions concerning the collection of this tax are carried out in accordance with the Law on Collection Procedures of Assets. In case of force majeure, it is postponed as equal to the term of assessment prescription. For postponing the assessment prescription, it is a must for the force majeure to occur / continue during / before the period of time when the taxation duty is required to be fulfilled. The force majeure occurring before or after the designated period for fulfillment of duty does not prolong the collecting prescription (Orhan, 1986). While the assessment prescription term ceases, the collecting prescription term continues to elapse.

Since the provisions that are related to the force majeure and their power to cease the procedures are prescribed in the Tax Procedure Law, it is exercised primarily on the procedures that are related to taxation phase (Karakoç, 2004, p. 255). According to the Tax Procedure Law, Article: 15, in case of any force majeure, the terms are recognized to be ceased until the force majeure ends. In other words, in case of force majeure, the legal terms that are stipulated by law or administration are ceased from the beginning until the end of force majeure. The term is re-started after the force majeure comes to an end. The duration is prolonged as equal to the period of time elapsed during the force majeure, and the duties that are fulfilled during this period are recognized to be fulfilled in time. Therefore, the taxpayer is not recognized as a tax offence for fulfilling his/her tax-related duties within the extension of time (Şenyüz, 2016, p. 269), thus not being subjected to tax penalty according to 373rd article of the respective law.
However, where the duties are not fulfilled in this extension, the taxpayer faces a tax penalty. In case of force majeure, it is not only the terms that are tax duty related terms that are subject to extension. The durations of certain rights of the taxpayer, which are entitled against the administration with regards to the taxation procedures, are subject to extension, as well. Force majeure may be claimed by the establishments granting certain rights to the taxpayers like reconciliation, requesting for remission (T.R. Ministry of Finance, 2011). However, there is no provision stipulating that the lawsuit processes are not recognized within the scope of a force majeure according to the Administrative Jurisdiction Procedures Law. Hence, the term of litigation is not principally subject to extension.

Occurring of force majeure may result in annullment of tax under certain circumstances. According to Tax Procedure Law, Article: 115, the following taxes are subject to annullment in full or partially by the Ministry of Treasure and Finance, in proportion to the damages, in case of fire, earthquake, landslide, flood, drought, frost, insect/vermin infestation and suchlike disasters:

- The tax liabilities and tax penalties of the taxpayers, losing at least 1/3 of their properties, within the scope of their income resources, which are damaged due to such disasters;

- The land tax liabilities and tax penalties accrued for the year coinciding with the harvesting and picking period of the taxpayers, losing at least 1/3 of their crops, accrued for the damages of the land exposed to disaster.

5.2. Challenging Situation

17th article of the Tax Procedure Law authorizes the administration to grant extension of time for certain situations, which have the ability to prevent the taxpayers to fulfill their tax duties in time, but not recognized within the Laws, nor as a force majeure. Challenging situations are subject to extension of time by law, where the challenging situation and its coverage are not described (Şenyüz et al., 2015, p. 215). The force majeure is a non-intentional and general event. Challenging situation, on the other hand, is the specific events, with a limited sphere of influence, affecting solely the respective person. The administration is the authority to make the final decision, whether the taxpayer is under challenging conditions, or not. While the extension of time is provided as default in case of force majeure, the challenging conditions required an application to be lodged to the administration, after which the extension of time is granted, provided the challenging conditions are confirmed by the administration. According to this, the Ministry of Finance and Treasury Department may grant an extension of time that is equal to one time more up of the legal term, and a suitable period of extension for matters not exceeding one month, where the legal term is less than one month, for those who are not able to fulfill their duties with regards to tax transactions for being under challenging circumstances. In addition to having the ability to transfer its power in full or
partially to the regional authority, the Ministry has the authority to exercise this power without stipulating a written application via provinces, districts, sectors, business lines or taxpayer groups. For this extension to be granted:

- The person claiming for extension of time must present his/her claim in written form before the deadline,

- The excuse presented in the request must be recognized as acceptable by the authorized body to grant the extension of time,

- Where the extension of time is granted, the collecting of the tax should not be imperiled.

5.2.1. Outcomes of Challenging Situations

With the challenging situation practice, the relationship between the taxpayers and the tax administrations are maintained amicably, as well as preventing those, who cannot fulfill their tax-related duties in time based on a justified reason, to be subjected to penalties (Çelik, 2000). In the event that the foregoing conditions occur, the administration may reasonably grant an extension of time to the taxpayer. Where the extension of time is granted, the taxpayer is allowed to fulfill his/her duties within the extension period. The duties that are fulfilled within the extension of period are recognized to be fulfilled in time. The challenging situation leads the extension of legal terms that are oriented at fulfilling the adjective tax duties. Therefore, it does not grant extension for the tax payment terms, which are not recognized as duties. Similarly, it is not possible extend the term of litigation with regards to tax dispute in case of challenging situations (Öner, 2014, p. 103).

5.3. Death

Having no description with regards to death, the liabilities that are related to the outcomes of death are stipulated in tax laws. Given that the Civil Code is characterized as generic, its provisions with regards to death are applicable to the tax laws, as well (Tosuner & Bay, Death and Its Results in Turkish Tax Law, 2017, pp. 219-220). The Tax Procedure Law assigns addressees for not leading any gap, where it is impossible for the taxpayers to fulfill their tax-related duties. One of these addressees is the inheritors that Show up after the death of a taxpayer (Budak, 2011, p. 50). It takes a long time for the inheritors to hear about the death, as well as fulfilling the duties of the taxpayer in accordance with the terms stipulated with various laws. In order to meet the requirements of the foregoing and ensure compliance with a 3-month period, stipulated by the Civil Code for disclaimer of inheritance, certain rights and duties are granted with an extension of three months (Özden, 1998, p. 55). However, 3 months of extension for terms in such manner is due to having no specific provision prescribed in law. One of
the general principles of law is that the special provisions are preferred primarily compared to the general provisions. In fact, there is a special regulation in the Income Tax Law, Article: 92, stipulating that the notification of death is to be submitted within four months after the death.

5.3.1. Outcomes of Death

In case of death, the legal terms are extended as equal to the duration of inheritance disclaimer. In other words, the extension of time based on the tax law is the period, assigned to the inheritor, coinciding with a period after death and oriented at the duties on tax returns (Kızılot et al., 2007, p. 182). It is out of question to talk about the extensions granted for payments.

According to 38th article of the Constitution, the penalties and security measures, which are recognized to be penalties, are personal. Accordingly, the person to be penalized must have a personality. For personality, he/she must be a person and alive. Considering that the dead cannot have a personality, it will be useless to penalize him/her (Bayraklı, 2006, p. 210). Therefore, the regulations have been made with regards to this matter within the scope of Tax Procedure Law, Article: 372. According to the provisions of this article, the penalty is quashed in case of death. The penalizations, which cannot be imposed in case of death, are only related to the penalties that arise out of the actions of the dead. Where the inheritors do not fulfill the duties on behalf of the taxpayer, who passed away, they are subjected to penalization as deemed required within the scope of Tax Procedure Law (Tosuner & Arıkan, 2017, p. 279). However, the situation is different for limited partnerships and collective partnerships. In that, the partnership, itself, is subjected to value added tax and income tax stoppage, while each partner individually subjected to income tax and income advance tax. Therefore, the penalties that are related to income tax and income advance tax are quashed (Association of Tax Inspectors, March 2016, p. 406). Within the scope of ordinary partnerships, the share of the partner, who passed away, is deducted from the penalties that are imposed on the partnership. Since the late fees and interests are not recognized as penalties, the tax liabilities, along with the foregoing, are transferred to the inheritors, who disclaimed the inheritance (Pehlivan, 2011, p. 100).

5.4. Extensions Granted for Financial Recess

A Financial Recess practice has been constituted by law no.: 5604 in order to provide the members of accounting professions and taxpayers with convenience for ensuring more productive and effective working by moving away them from intense work-environment stress. According to the first article of this law, a financial recess is applied every year starting from the first day of July until the twentieth day (including this day). Where the last day of June is a non-working day, the financial recess is started on the day after the first working day in July. The financial recess takes the following into its scope: the transactions that are recognized within the
duties of taxpayers and which are required to be fulfilled a certain period of time, terms with regards to litigation, administrative application and claiming for rights, liabilities with regards to tax audits, terms for notifying the administration, liabilities with regards to keeping and submitting the books of accounting (Şenyüz et al., p. 218). These terms are not recognized to elapse during the financial recess. Some of the terms, of which last day coincides with the financial recess are recognized to be granted with an extension of seven days, starting from the first day after the end of recess. According to this provision, the following are granted with a seven-day extension;

- Submitting tax returns, which are required to be done between 1st to 20th July,
- Payment term for taxes, fees, charges and tax penalties, including the late fees, coinciding with between 1st to 20th July, in line with the additional, ex-officio or administrative assessments,
- Application periods for claiming reconciliation or benefiting from the remissions for penalizations and/or imposed taxes,
- Notification periods with regards to the information within the scope of the continuous notification provisions.

The legal and administrative terms coming to an end within five days after the end of financial recess are recognized to become on the fifth day of the end of financial recess, at the close of business. In other words, the deadlines that coincide to between 21st to 25th July are extended to the 25th July, to the close of business day. The payment period for taxes, of which tax return period is extended in such manner, is recognized to be extended until the last day of tax return period, to the close of business day. The payment period of the taxes, to be accrued starting from 25th July will be recognized as 26th July.

Excluding the search-investigations that are carried out by court decision or requested by the Public Prosecutors or in accordance with the provisions of Tax Procedure Law, no books and documents can be claimed for investigation, nor making an audit in the business place of the taxpayer, during the financial recess. Inquiry requests, excluding those for tax/penalty notifications and settlement claims, are not notified to the taxpayers, including the tax and penalty responsible parties during the financial recess. However, the period continues to elapse legally starting from the last day of the financial recess, with regards to the notification transactions during the process.

No financial recess is applicable for private consumption tax, banking and insurance transaction tax, special communication tax, gambling tax, including the taxes, charges and fees imposed and/or collected by the custom administrations, provincial special administrations and municipalities (i.e. value added tax received for importation, real property tax, environment
tax, etc.). Therefore, the taxpayers must submit the tax returns and make the payments for tax liabilities as deemed required by law within this scope.

5.5. Extensions Granted for Judicial Recess

State Council, regional administrative, administrative and tax courts are provided with a recess starting from 20th July until 31st August, ending in the 1st of September, every year. According to Administrative Jurisdiction Procedures Law, Article: 8, where the periods/terms as prescribed by law coincide with the recess period, these periods are granted with a seven days of extension after the last day of the recess. Judicial recess includes the following procedures: terms of litigation, prosecution’s respond, defense by the administration, renewal of the petition where the litigation is not started and appeal (Şenyüz et al., 2015, p. 221).

According to the Administrative Jurisdiction Procedures Law, Article: 7, the term of litigation for the taxpayers against additional, ex-officio or administrative assessments is 30 days for the tax courts. Where the last day of litigation term coincides with the judicial recess, the term of litigation starts to elapse legally again, after the end of judicial recess, due to not elapsing during this period (Öner, 2014, p. 104). Therefore, the litigation term is granted with an extension that is equal to the period of time, coinciding with the judicial recess. Where the last day of the extension coincides with the judicial recess, the term of litigation is extended for seven days, starting from the first day after the end of the judicial recess. As can be seen, the financial recess ceases the term of litigation, while the judicial recess extends it.

5.6. Miscellaneous Extensions

The extensions may be granted for some other situations within the scope of Tax Procedure Law, in addition to the foregoing. The other reasons for which extensions are granted, are as follows:

- According to the 111th Article of this law, the Ministry of Finance and Treasure authorizes the tax administrations having more than 500 taxpayers to grant an extension of 15 days starting from the first day after the maturity date, with regards to making payments. The period to be defined by the Ministry within this scope is recognized as the maturity of the tax.

- According to the 144th article of the law, conservation of books and documents does not revoke the duty to submit the due tax returns. Where the duration between the conservation date and the due date for submitting the tax return is less than one month, the submitting period is extended for one month by itself.

- According to the supplementary Article: 7 of the law, in the event that the taxpayer applied for reconciliation after assessment, yet no agreement is reached and that the maturity date
of litigation is less than 15 days, the term of litigation is extended for 15 days after receiving the report certifying that no agreement has been reached.

Other reasons that lead the extensions of time are not limited to the Tax Procedure Law. According to the Ombudsman Institution Law, Article: 17, the application for complaint to the Ombudsman Institution within the term of litigation for conflicts arising out of taxes, charges, fees and similar financial burdens, including increases and penalties arising out of the foregoing, ceases the term of litigation, which started to elapse legally. The cased term starts to re-elapse from the first day after the decision that is made by the Institution.

Conclusion

The term is the time dimension specified for any procedure to be fulfilled. Elapsing of time, as a natural event, is also a legal event, due to the legal consequences that are related to it. The terms in law are of importance in terms of being entitled to, exercising and losing rights and powers. The terms are prescribed for fulfilling certain procedures or duties within tax law, which is within the scope of public law. The regulations for the terms within the tax law have been generally made by laws. Additionally, examining the tax legislation, it can be clearly seen that administrative or judicial periods are available as oriented for providing convenience in fulfilling the tax-related duties.

The provisions concerning the terms in declaration based taxes, prioritizing the assessment and statement principles of the tax, have been prescribed by Tax Procedure Law. The provisions of terms, as prescribed by Tax Procedure Law, are similar to those regulated in other fields of law in terms of their legal characteristics, yet not leading the consequences that are completely same. The prescription periods and adjective terms are adjudicated based on the characteristics of tax law. For example, it has been acknowledged that the periods, including the prescription periods due to force majeure, do not legally recognized as elapsed, as different from the other fields of law. Additionally, the sanctions for this matter also differ from the other fields of law, in the event that the periods/terms are recognized to be elapsed.

There are various terms/periods available with regards to the powers of tax claimants, as well as the rights and liabilities of taxpayers, tax responsible parties in tax law within the scope of protecting taxpayers’ rights. Naturally being of vital importance, the terms in tax law are also important with regards to being well-adopted by the taxpayers. In that, most of these periods possess the characteristics of final terms. Not complying with the requirements of these periods/terms leads to loss of rights, as well as penalization of taxpayers or tax responsible parties. Therefore, it is a must for the provisions concerning the calculation of periods that are closely related to the rights and duties of taxpayers to be examined thoroughly, while being regulated in a comprehensible manner, not leading to interpretation.
References


Part IV.

Chap 5.

Taxation of Cryptocurrencies in Turkey: In Particular Bitcoin

Özay Özpence*, Bilal Göde**

Introduction

The word of money is defined in TLS (Turkish Language Society) as “means of payment from paper or metal, cash issued by State on which the value is written.” Money is defined as “everything that people will accept for money.” It is not arbitrary that something is defined as Money. There are two functions which are required to exist for a thing to be considered money. These are the function of the money being the "exchange tool" and the "value storage tool." The purchasing power of what is determined as money in this way depends on its supply and demand primarily. (Galbraith, 1990: p. 30) For this reason, the means to be used as money must first be generally accepted by the society.

In an environment where money is not available, an exchange economy (barter) will exist. Someone who sells apples and wants to buy shoes calculates how many apples equal to shoes she wants to buy and then it is necessary for the counterparty to approve in order to be able to get the shoe. Taking into consideration that there are hundreds of goods in any given market and that the characteristics of each good are different, it will be possible to understand the importance of the money economy better.

Before the emergence of money in the modern sense; a variety of things from seashells to precious metals have been used as a means of exchange. The Chinese used leather money at B.C. 118. In A.D806, the first paper money was also used by the Chinese.

The printing and use of paper money in the western world coincide with the end of the seventeenth century. The first paper money in the United States was used in the 1690s by Massachusetts government. In England, it is issued by jewelers and given into circulation. It is also seen that it become widespread with the establishment of the Central Bank of England in 1694 and later the central banks of other countries (CBRT, 2017).

---

* Associate Professor oozpence@pau.edu.tr, Pamukkale University, Public Finance Department, 0258 296 2947
** Research Assistant bgode@pau.edu.tr, Pamukkale University, Public Finance Department, 0258 296 2794
1. Definition and Characteristics of Money

Money has emerged in many different places and at different times. The emergence of money is not a technological turning point, but a mental revolution. Such a revolution is that a reality that people make it exist and believe in their minds. It is not right to think of money only as metals, banknotes, and to pinch it into this definition. Money is something that is generally accepted by the society in order to be able to trade goods and services. Thanks to the money, people easily value different products, can explain the demands for these goods and services and buy and sell these goods and services. In addition, people can also use the money as a means of accumulation by selling their excess product. Many types of money have been used throughout history. Among these, the most well-known is the printed metal coin. Before the use of mines in the form of money through printing, many different objects have been used as money. Objects such as seashells, animal skin, fabric, beads, seeds, etc. were used as money. In throughout Africa, South Asia, East Asia and Oceania, seashells have been used as money for four thousand years. In Uganda, which was in the British colonial, the tax was still payable on the seashells in an early 20th century. (Harari, 2015: p. 182).

States declare that they print paper parts in standard forms and these pieces of paper are valuable, and people should use these papers for shopping. The people living within the borders of the State also use these pieces of paper in their economic transactions. The state has the possibility to receive taxes from the citizens on this point, and the taxes are demanded in the form of these papers. For this reason, citizens are obliged to keep these papers in their hands. As these papers become accepted in society and become available to everyone, states that have the authority to produce papers also gain strength. Even if someone says that these papers are not really worthy and object to this system, this will not change the situation. (Harari, 2016: pp. 190-191).

Money has no other values except the economic value. It is not possible to use metal or paper money as eat, drink or dress. But it is possible to buy bread for eating, milk for drinking and shirts for wear using the economic value of money. In order to carry out these transactions, the baker must accept the money for the bread, the grocery store for the milk and the boutique owner for the clothes. For example, if the baker does not accept your money, you can go to a market that accepts your money to buy bread, but if the market owner does not accept your money, your money will have no function. The money will lose its nominal value and will be just paper. (Harari, 2016: p. 162). In this sense, the general belief in the money keeps that currency stands or destroys if that belief is disappearing for some reasons.

Similar situations have been experienced in the past. On 3 November 1985, the Myanmar government abruptly demonetized 25, 50 and 100 kyat banknotes. It was also deprived of the possibility for the public of replacing these banknotes. These banknotes, which the public have accumulated over many years of labor, have fallen to a level of paper. In the 75th August
of the Myanmar dictator, state remonetized 15 and 35 banknotes instead of these banknotes. On September 5, 1987, the government demonetized 35 and 75 banknotes suddenly. (Harari, 2016: pp. 162-163).

Briefly, money can be anything that fulfills the following functions:

- Being a measure of investment and savings, that is, people can accumulate it and then use it to meet their needs - they organize purchases over time
- Being an accounting unit providing a common base for prices.
- Being a means of exchange, people can use it when buying or selling something from another person (IMF, 2012).

2. Cryptocurrencies in Particular Bitcoin

The changing of the needs of day by day, increase the rate of use of high-tech industries and services such as computers, the internet, mobile phones, online financial instruments, digital money and so on makes the economies even more integrated. Increasing international sharing turns economies into a single global economy. (Özpençe, 2014: p. 67) Digitalization of the economy has led to the digitalization tools in general. The digitalization of money is also an important example.

According to the European Central Bank, virtual currency is expressed as a numeric currency that a particular group uses to exchange in a virtual environment among themselves and its exporting and supply / control is performed by developers of the system, it is not dependent on arrangement and regulation. (ECB 2012, p. 13).

<table>
<thead>
<tr>
<th>Legal Status</th>
<th>Unregulated</th>
<th>Regulated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Certain types of local currencies</td>
<td>- Banknotes and coins</td>
</tr>
<tr>
<td></td>
<td>- Virtual currency</td>
<td>- E-Money</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Commercial bank money (deposits)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Money Format</th>
<th>Physical</th>
<th>Digital</th>
</tr>
</thead>
</table>

**Source:** European Central Bank

The reason for the use of the word "crypto" in the definition of cryptocurrency is that the use of certain cryptographic systems in the production process. According to the classification of the ECB; cryptocurrencies are considered within the scope of virtual currencies that are not
subject to regulation. The reason for not being subject to regulation is that it is not connected to any central bank, government or similar institution. (Plassaras, 2013: p. 391).

Conceptually, crypto-money is defined in two ways. According to the first definition, crypto-money are digital currencies that are without a physical counterpart and are not legally regulated. The second definition was made by Friedrich A. Hayek as "private money". This was defined as the fight of this currency provided by a private enterprise against the monopoly of the money supply by the government. (Plassaras, 2013: p. 382).

Cryptocurrency is a concept that has emerged in recent years and is most commonly referred to as numeric currency or digital commodity. Bitcoin is the first example of cryptocurrency, entered our lives in 2009. The core of the concept of cryptocurrency is the exchange of virtual values created by using individual personal computers of individuals, independently of any country or organization. Cryptocurrency is not issued or checked by a specific central bank, country or organization, such as traditional currency (Dollar, Euro, TL, etc.)

There are two theories about the emergence of cryptocurrency. According to the first theory, especially in the aftermath of the global financial crisis in 2008, this idea emerged against the possibility of the inflationary effect caused by increasing the amount of money in the market as a result of the high amount of foreign currency to overcome the effects of the crisis in the USA. The second theory is that the digitization movement that emerges with the developing technology itself is realized in the money field. The second theory, based on the fact that money is now also digital, is more plausible today when everything begins to digitize.

Cryptocurrency meets the following money characteristics which are defined in the literature:

- Being a means of exchange
- Being a value measure
- Being investment and saving the measure

It is an expected development for cryptocurrency to spread rapidly in this regard.

Bitcoin, the first and the most popular cryptocurrency today was developed by Japanese software developer Satoshi Nakamoto on 1 November 2008. The introduction of this cryptocurrency was done with a mini-paper signed by Satoshi Nakamoto and entitled "Bitcoin: A Peer-to-Peer Electronic Cash System" (Nakamoto 2008: p. 1). Thanks to the fact that the Bitcoin system is an open-code system, the system can be made more powerful by the users day by day. The number of Bitcoins has been limited to a maximum of 21 million and production will stop when this number is reached. In this respect, the system has taken measures to prevent over-production inflation.
BTCs can be classified as flat money. The flat money is something that represents a monetary value which is not a valuable mine but is used to buy goods or services. Flat money takes its value from the law or by those who accept. (Velde, 2013: p. 2). The point that BTC differs from the flat money is that there is no state or an agency that controls them.

For Bitcoins, the buyer and seller contact directly and have an address. These addresses are different for everyone, and personal information is kept secret since all of these different addresses are encrypted. For these transactions, there is a virtual record that is not a recording center, transparent and does not contain personal information. The database in which these records are kept records the interlocutors, amounts and times of transfers. (Lee Kuo Chuen, 2015:p. 254). The use of Bitcoin is increasing day by day. The ecosystem is expanding due to the fact that third parties do not interfere with the transfers and the confidential nature of their structure.

*Figure 1. Market Value and Price Change of Bitcoin between July 2017 and July 2018 (USD)*

Figure 1 shows the market value of Bitcoin as of July 2017 and the purchase price of 1 Bitcoin on the market. The price of Bitcoin, which was around 2500 dollars in July 2017, has increased to 20 thousand dollars in December 2017 and then declined to the level of 7 thousand dollars as of February 2018. Bitcoin has reached the highest market value in December 2017, and this amount has exceeded 320 billion dollars. As of July 2018, the total market value is around 100 billion dollars.
Bitcoin is also the subject to futures contracts. As of December 10, 2017; Bitcoin will start to be traded on the Chicago Board Options Exchange (CBOE) platform which is the largest options market in the USA and also will begin operations in CME Group which is the world’s largest futures exchange. (BusinessHT, 2017). Enforcement of these applications makes Bitcoin an investment tool for future planning.

2.1. Advantages and Disadvantages of Cryptocurrencies

There are some features that distinguish cryptocurrency from traditional currency. For traditional currency; there is a state in which money belongs to and symbolizes the power of sovereignty. But, such a situation is not in question for the cryptocurrency. Thanks to the Blockchain technology that cryptocurrency is raised on, it is possible to transfer money without affiliation to any organization. Since transactions are performed from one wallet to another, it is not necessary to comply with working hours for the transfer of money. Transfers have transparency up to a point. It is possible to see the amount of money transferred and to which wallet it was sent, but it is not possible to access the credentials of the wallet owners.

There is no need for any intermediary facility for money transfers. This means that you will not be subject to any tax treatment during transfers. This is an important factor in reducing transfer costs compared to conventional methods. (Lee Kuo Chuen, 2015: p. 23).

Return is not possible in transfer transactions that are performed by using cryptocurrency. The transfer is realized as a result of the direction, and the transferred amount cannot be recovered unless the other party wishes.

The absence of any regulatory resource for cryptocurrencies prevents these currencies from being affected by the effects outside the market. In this case, the value of the cryptocurrencies is determined by the supply and demand conditions in the market. The negative side of this situation is that there is no regulatory authority in case of fluctuations.

The storage of cryptographic currencies is generally performed through online wallets. While this provides a certain level of confidentiality to the person, it also brings some certain risks at the point of securing the security of this money. Due to not having an upper institution, there is no authority to complain in case of a possible theft (Lee Kuo Chuen, 2015: p. 23).

While traditional institutions can implement accounts such as freezing and seizure, this is not the case with cryptocurrency. Due to the confidentiality of personal information, illegal transactions are also opened through cryptographic currencies.
The likelihood of declining credibility as a crypto paradigm determines the future of these currencies. Due to the increase in the belief, an increase in the reputation of money will bring about the increase of the value and the expansion of the usage area. The opposite situation, declining belief that in cryptocurrency will bring the collapse of these currencies. (Plassaras, 2013: p. 391).

Table 2. Cryptocurrencies with the highest market value (Top 10)

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Market Cap</th>
<th>Price</th>
<th>Volume (24h)</th>
<th>Circulating Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bitcoin</td>
<td>$141,425,273,797</td>
<td>$8,237</td>
<td>$6,958,770,000</td>
<td>17,168,637</td>
</tr>
<tr>
<td>2</td>
<td>Ethereum</td>
<td>$47,830,667,067</td>
<td>$474</td>
<td>$2,222,210,000</td>
<td>100,896,660</td>
</tr>
<tr>
<td>3</td>
<td>XRP</td>
<td>$17,807,213,201</td>
<td>$0,4</td>
<td>$306,619,000</td>
<td>39,315,683,476</td>
</tr>
<tr>
<td>4</td>
<td>Bitcoin Cash</td>
<td>$14,693,134,682</td>
<td>$851,5</td>
<td>$871,113,000</td>
<td>17,255,225</td>
</tr>
<tr>
<td>5</td>
<td>EOS</td>
<td>$7,589,454,203</td>
<td>$8,4</td>
<td>$976,305,000</td>
<td>896,149,492</td>
</tr>
<tr>
<td>6</td>
<td>Stellar</td>
<td>$5,634,825,262</td>
<td>$0,3</td>
<td>$104,377,000</td>
<td>18,767,299,129</td>
</tr>
<tr>
<td>7</td>
<td>Litecoin</td>
<td>$5,078,400,808</td>
<td>$88,2</td>
<td>$422,773,000</td>
<td>57,551,357 LTC</td>
</tr>
<tr>
<td>8</td>
<td>Cardano</td>
<td>$4,469,956,596</td>
<td>$0,17</td>
<td>$188,160,000</td>
<td>25,927,070,538</td>
</tr>
<tr>
<td>9</td>
<td>IOTA</td>
<td>$2,706,297,999</td>
<td>$0,97</td>
<td>$45,225,300</td>
<td>2,779,530,283</td>
</tr>
<tr>
<td>10</td>
<td>Tether</td>
<td>$2,500,378,588</td>
<td>$0,99</td>
<td>$4,213,540,000</td>
<td>2,507,140,346 U</td>
</tr>
</tbody>
</table>

The data were obtained on 25/07/2018.

Source: Cryptocurrency Market Capitalizations

Table 2 lists the top 10 cryptocurrencies with the highest market value as of 25.07.2018. The total value of the money on the table is about 250 billion dollars. The currency with the highest value which is also the most known currency is Bitcoin. 17 168 637 of Bitcoin, which is limited to a maximum of 21 million units that can be produced, is in circulation as of the base date. Bitcoin production is getting harder every day. Bitcoin price is $8,237 based on the date.
Table 3. Cryptocurrencies which most transactions are made according to the 24 hours trading volume

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Market Cap</th>
<th>Price</th>
<th>Volume (24h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bitcoin</td>
<td>$141,425,273,797</td>
<td>$8,237,42</td>
<td>$6,958,770,000</td>
</tr>
<tr>
<td>2</td>
<td>Tether</td>
<td>$2,500,378,588</td>
<td>$0,997303</td>
<td>$4,213,540,000</td>
</tr>
<tr>
<td>3</td>
<td>Ethereum</td>
<td>$47,830,667,067</td>
<td>$474,06</td>
<td>$2,222,210,000</td>
</tr>
<tr>
<td>4</td>
<td>EOS</td>
<td>$7,589,454,203</td>
<td>$8,47</td>
<td>$976,305,000</td>
</tr>
<tr>
<td>5</td>
<td>Bitcoin Cash</td>
<td>$14,693,134,682</td>
<td>$851,52</td>
<td>$871,113,000</td>
</tr>
<tr>
<td>6</td>
<td>Litecoin</td>
<td>$5,078,400,808</td>
<td>$88,24</td>
<td>$422,773,000</td>
</tr>
<tr>
<td>7</td>
<td>TRON</td>
<td>$2,473,871,323</td>
<td>$0,037627</td>
<td>$307,080,000</td>
</tr>
<tr>
<td>8</td>
<td>XRP</td>
<td>$17,807,213,201</td>
<td>$0,452929</td>
<td>$306,619,000</td>
</tr>
<tr>
<td>9</td>
<td>Qtum</td>
<td>$721,539,418</td>
<td>$8,14</td>
<td>$213,858,000</td>
</tr>
<tr>
<td>10</td>
<td>Ethereum Classic</td>
<td>$1,702,116,896</td>
<td>$16,48</td>
<td>$210,745,000</td>
</tr>
</tbody>
</table>

The data were obtained on 25/07/2018.

**Source:** Cryptocurrency Market Capitalizations

Table 3 lists the top 10 cryptocurrencies based on 24-hour volume figures. Bitcoin is the most widely known cryptographic currency and the currency that makes up almost half of the total cryptographic money market. The amount of Bitcoin traded within 24 hours has reached nearly 7 billion dollars. The 24-hour total cryptocurrency trading volume is at the level of 20 billion dollars on the same date. This high level of trading volume of Bitcoin is an important indicator of confidence in Bitcoin. The numbers can change instantly as trading transactions are made constantly.
Table 4. Bitcoin stock exchanges where the most transactions are made according to the 24 hours trading volume

<table>
<thead>
<tr>
<th>Source</th>
<th>Volume (24h)</th>
<th>Price</th>
<th>Volume (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bitfinex $490,349,000</td>
<td>$8,254,90</td>
<td>7,04%</td>
</tr>
<tr>
<td>2</td>
<td>Binance $460,670,000</td>
<td>$8,229,50</td>
<td>6,62%</td>
</tr>
<tr>
<td>3</td>
<td>OKEx $302,228,000</td>
<td>$8,235,58</td>
<td>4,34%</td>
</tr>
<tr>
<td>4</td>
<td>Huobi $228,364,000</td>
<td>$8,228,06</td>
<td>3,28%</td>
</tr>
<tr>
<td>5</td>
<td>ZB.COM $183,731,000</td>
<td>$8,228,30</td>
<td>2,64%</td>
</tr>
<tr>
<td>6</td>
<td>C2CX $175,342,000</td>
<td>$8,230,60</td>
<td>2,52%</td>
</tr>
<tr>
<td>7</td>
<td>Bitstamp $149,404,000</td>
<td>$8,245,29</td>
<td>2,15%</td>
</tr>
<tr>
<td>8</td>
<td>Coinbase Pro $148,960,000</td>
<td>$8,256,40</td>
<td>2,14%</td>
</tr>
<tr>
<td>9</td>
<td>Upbit $130,618,000</td>
<td>$8,205,94</td>
<td>1,88%</td>
</tr>
<tr>
<td>10</td>
<td>ZB.COM $112,535,000</td>
<td>$8,238,39</td>
<td>1,62%</td>
</tr>
</tbody>
</table>

The data were obtained on 25/07/2018.

Source: Cryptocurrency Market Capitalizations

Stock market securities mean an organized market that allows the supply and demand for gold, goods, money and buying and selling of foreign exchange to come face to face in a certain time and place. (Keyder, 2008: p. 16). As Bitcoin is used for trading purposes, Bitcoin itself is also subject to buying and selling via brokers.

Table 4 shows the market value of the transactions conducted within 24 hours on Bitcoin (BTC) stock exchanges. There are hundreds of stock exchanges where Bitcoin is traded. The top 10 exchanges that traded the most are controlling about 35% of this trading volume. In Bitfinex, which has the largest volume, $490 million of Bitcoin is changing hands daily.

However, the taxation of such a large market will be a significant income item for the states. As it is known, the tax is the most important of income items for states, the most vital means of financing (Göde & Gölçek, 2016, p. 219). For this reason, some countries are aiming to implement policies for taxing the profits derived from cryptocurrencies, primarily in the US and Australia. However, while the cryptocurrency market is not very convenient for taxation, the taxation of such money has also come to our country.
3. Taxation Of Cryptocurrencies By Turkish Tax System

Cryptocurrencies do not comply legally with the definition of money in the Turkish legal system. The power to issue money was considered an important privilege in every period from past to present day. According to Article 87 of the Constitution; the decision for issuing money or not are among the duties and authorities of the Grand National Assembly of Turkey. Parliament delegated its authority on banknote issuance to the Central Bank. This authority is still included in the current Central Bank Act. (CBT) In accordance with Article 36-b of the Central Bank Law; banknotes issuing authority belongs to the Central Bank of Turkey.

According to Article 3-ç of the Law No. 6493 on Payment and Securities Settlement Systems, Payment Services and Electronic Money Organizations; the electronic money is defined as “Monetary value issued on receipt of funds, stored electronically, used for the purpose of making payment transactions described in this Law and accepted as a payment instrument by natural and legal persons other than the electronic money issuer”.

Again according to Article 4-d under the same law, the following information is provided as “Legal person that has been granted authorization to issue electronic money under the scope of this Law.” According to this definition, Bitcoin is not accepted as electronic money in terms of Turkish legislation. From this point of view, the nature of the cryptocurrency must first be determined by law. In the case of Bitcoin, it is possible to see wallets and transferred quantities, although the money transfers closed to outside interference. Businesses or individuals who will accept payment by cryptocurrency through legal legislation; there must be a requirement to declare their wallet numbers. Thus, there will be the wallet number of every economic agent just like the tax number, and transactions will be examined transparently.

The US Tax Office (IRS) has filed a lawsuit against Coinbase, one of the largest cryptocurrency stock exchanges in the world. As a result of this lawsuit; the court ruled that the information of the users who traded over 20 thousand Dollars between 2013 and 2015 was given to the IRS. (30 November 2017,NTV). Coinbase explains with this decision that the number of people to share information is 14 thousand. (1 December 2017, Fintechtime) With the acquisition of the information, the IRS will be able to initiate tax transactions on these persons. With this decision taken in America, the courts will be able to ask the coin stock exchanges and coin wallet companies for the information they need regarding taxation. After obtaining the information, the taxation process can be operated.

Legal basis is required for the taxation process to be realized. According to Article 73 of the Constitution; Taxes, levies, charges and similar financial liabilities are brought by law, amended or removed. As per this article; a tax which is not defined as legally can not be collected. In this respect, the cryptocurrencies must be defined in the Turkish Tax System. In the present case, such a definition is not realized.
According to the Article 2 of Income-tax law; earnings and revenues that are under the scope of income are as follows:

- **Commercial earnings,**
- **Agricultural earnings,**
- **Wage,**
- **Self-employment earnings,**
- **income from immovable property,**
- **earning on movable assets,**
- **Other earnings and revenues.**

"Unless otherwise provided in this Law, actual and net amounts of the above-mentioned earnings and revenues are taken into account in the determination of income." In order to be taxable, the taxable income must be under one of these income types.

Although specific knowledge is required for the production and trading of Bitcoins, it will not be appropriate to assess the gains from these activities within the context of self-employment earnings.

For the purpose of performing these transactions; a certain level of technological and therefore capital infrastructures is required. It will be more accurate to evaluate the gains from bitcoin production (mining) and trading within the scope of commercial earnings. Since it is evaluated within the scope of commercial earnings; Cryptocurrencies will be subject to VAT if not covered by the exception applications.

According to the Value Added Tax Law No. 3065 Article 17, 4-g), (Amendment 16/7/2004-5228/15 md); the followings are exempted from VAT;

According to the Capital Market Law dated 6/12/2012 and numbered 6362;

to hand to exchange between stock exchange members, to import for trading in a stock exchange established in Turkey and delivery to the stock market regarding the delivery of mass gold, mass silver, precious jewelry (diamond, brilliant of a diamond, ruby, emerald, sapphire, chrysolite, pearl), cash, foreign currency, official stamps, valuable papers, stocks, bonds (including financing services provided by buying bonds, limited to the obtained interest income) rental certificates issued by asset leasing companies, capital market instruments traded on a stock exchange established in Turkey, delivery of metal, plastics, rubber, paper, glass, scrap and
their churns. Through legal regulation, cryptocurrencies must be subject to VAT if it is not included in the scope of the exception.

In order to be taxable, the value of the cryptocurrencies should be determined on a domestic currency basis and declared according to this value. At the point of arranging this value; the following law is taken as a basis:

VAT Law Article 26:

If the price is calculated in foreign currency, the foreign currency is converted into Turkish currency on the current exchange rate at which the event is giving rise to the tax occurs. The Ministry of Finance and Customs determines the principles for the conversion of currencies with current uncertain rates into Turkish currency.

If the ministries do not use authority in this matter; VUK (Tax Procedure Law) Article 289 is followed. “From the economic assets that are not written or written in this section and which are not allowed to be valued by their own measurement are valued; building and land are valued through tax value; others are valued through fair value, if available, or value in the account. If this is not available too; valued at the precedent price.”

One of the criticisms made against cryptocurrencies is related to the uncertainty of the source. This can be explained by “Law No. 6736 Law on Restructuring of Some Receivables; Heading of National Asset Acquisition of Some Assets Article 7: “natural and legal persons who brought currency, gold, foreign exchange, securities and other capital market instruments to Turkey until 31.12.2016 under the provisions of this Article, they can freely save their assets

Although it is written 31.12.2016 in law text; cash repatriation law which is extended until 31.06.2017 indicates that the economic assets coming to the country could be freely saved. A similar arrangement can be made for the cryptocurrencies.

4. Results And Recommendations

With the expansion of the electronic payment ecosystem, the use of electronic money is increasing day by day. The cryptocurrencies examined in this study are the last examples to be given in electronic currency. Cryptocurrencies have reached very high usage rates in recent years. The basis of this system is digital algorithms and services. The availability performance of Bitcoin, the first and most common example of cryptocurrency, has been increasing since 2009.

Bitcoin ensures that individuals can operate with low cost, flexibility and freedom with verification and mining performed devices of system-connected users, based on innovative algorithmic processes, regardless of central banks or any organization.
Throughout its history, humanity has always pursued a progressive course and constantly increased its knowledge. Cumulative knowledge accumulation has opened the way for new inventions as well as enabling new information to be learned. This constant progress has led to radical changes in all areas of life. The economy is one of the most important areas exposed to these fundamental changes. The effects of changing technology in the functioning of the economy, which is at the center of the community life, has been seen increasingly. Today, when the transition from the physical process to the digital process is accelerating, the basic pillars of the economy are constantly changing, demolishing, and new pillars are added when necessary.

It has been compulsory for people to have common means of exchange with the increase in the economic relations of people with each other after the settled life, and for these purposes, they have used a wide variety of means for these purposes. Seashells, beads, etc. have been used both as an intermediary tool and as an investment tool. As the day-to-day approaches, the currencies become standardized and become one of the sovereign symbols of the states. After the standardization of the money and the improvement of the monetary system, the integration between the economies is also accelerated. With the development of technology, the digitalization seen in every area of life has shown itself in the economic field, and the money begins to shift towards the virtual space. With the birth of electronic money, transaction costs have fallen, and the concept of overtime for transfers has been eliminated. The possibility of transferring money between continents at high speed has emerged. Encryption systems are used at the point where these currencies are produced, and the “cryptocurrency” term has been started to use for this reason. The forerunner of the cryptocurrency is Bitcoin which emerged in 2009. After Bitcoin, which is still in production (mining), a lot of cryptocurrencies has emerged, and new products are emerging every day. The taxation of transactions that are the subject of cryptocurrencies, which is increasing day by day, is also an important problem. Attempting to apply traditional methods and principles at the point of taxation of cryptic currencies, which is contrary to the traditional definitions, brings serious problems. For this reason, it is essential that a serious legislative work needs to be carried out in order to determine the place of cryptocurrency in taxation procedure.

In the event that the cryptocurrencies that are used every day are excluded from the tax, the states will suffer tax loss very seriously. When we look at Turkey, more than 80% of public revenues come from taxes, and taxes are seen as the most important item of state income. Serious erosion of this income structure is inevitable when there is no taxation for the cryptocurrency. Therefore, a legal framework must be established urgently, and especially domestic cryptocurrency wallet should be formed. Since the wallet becomes native, it will be possible to respond to legal regulations in a shorter time and more effectively. Also, based on a court decision
the US; the transfers and the quantities in the wallets must be determined and taxed by obtaining the user information from wallet companies which are originated from Turkey or not.

There are two options at the point of taxing transactions that are subject to cryptocurrencies. The first case is that Bitcoin should be regarded as a commodity. When legislation is regulated as commodities; purchase and sale works will be subject to VAT, in this case, the tax will be levied on these transactions. The VAT rate may vary depending on what kind of goods the bitcoin will be identified as. Tax administration will apply VAT collection obligation to Turkey welded stock (Paribu, BTCTurk, Koinim, Koinex) where currently Bitcoin and other cryptocurrencies are bought and sold.

This stock market will be liable to pay VAT to the tax administration which will arise from the purchase and sale of virtual money. At this point, the virtual money stock market will be tax liable in accordance with its definition specified in Article 8 of VUK “The Taxpayer is the person who is the object against the creditor tax office in respect of the payment of the tax.”

The second option at the point of taxation of transactions where cryptocurrency is the subject is that lawmakers legally define cryptocurrencies as "money" and make legal arrangements for it. Since the trading of cryptocurrencies that are legally defined as money at this point will be an exception to VAT; VAT obligation will not arise only from trading. After the legal definition is made, it is imperative for persons who will operate with virtual currencies to notify their crypto wallet numbers to the tax office, and they must have their wallet numbers like the citizenship numbers of the persons. After the legal requirement that all individuals declare their wallet numbers, it will become possible to carry out taxation transactions in the transactions arising from the purchase or sale of goods or services made with cryptocurrencies. Everyone who wants to make transactions with cryptocurrency such as Bitcoin and so on. must get a wallet number and make this number declared to the tax administration and serious sanctions must be envisaged for those who do not declare their wallet number. When Bitcoin is used for purchasing goods or services; the number of the wallet to which Bitcoin is sent, the amount of Bitcoin sent and the account number of the receiver is automatically recorded to the database. In this case, if any of the parties have declared the purse number, then it is possible to determine the non-declaring party if the other party does not declare it. For the payer who declared his wallet number, it will be possible to determine the economic agent which is the other side of the transaction and therefore to apply the criminal procedure.

Due to the fact that the details of transfer in bitcoin transfers are automatically recorded in the database; it is not possible to make a play over the transferred quantities. Therefore; an important measure is taken by the system in order to prevent tax evasion. Since the date of Bitcoin
emerged; all transactions that have been done so far are registered in the database and cannot be deleted. Accordingly, it will be possible to do retrospective inspections through the identification of wallet numbers. Tax administration should go to a serious reorganization at this point, and a cryptographic unit must establish a unit to operate in the area of cryptocurrency. In this unit, there must be software experts who understand the software part of the currencies such as Bitcoin and alike and supervisory purpose-trained employees should also be involved.

Since money issuing is monopolized by the state, it is unlikely that cryptocurrency such as Bitcoin and so on will be described as "money" by legal systems. By looking at this framework, it is anticipated that the cryptocurrencies will be treated as a commodity, which is a more likely scenario.
References


First Part
Economic Crime and Fraud

1. Economic Crime

1.1. The Concept Of Economic Crime

Today, due to the increasing importance of protecting individuals against economic crime, the definition, classification and effects of these crimes must be done right beyond the traditional methods of combating crime. To give a definition, economic crime, "may be defined as an illegal act committed by persons with professional skills, usually by deceit or lying in order to gain unfair advantage against personal or organizational gain or against other individuals or entities, or as a set of constantly evolving actions." As seen in the definition, the important method used in the processing of economic crime is the fraud that the perpetrator makes, and since these crimes do not involve violence, the possibility of individuals being vulnerable to these crimes is increasing. (Tezer, 2005: s. 30)

1.2. General Characteristics of Economic Crime

Economic crime, despite its non-violent nature, leads to significant economic losses. The fact that crime is complicated and organized and crime is becoming widespread necessitates the establishment and execution of a system in order to combat these crimes. Especially because fraud is a diverse phenomenon of fraud, it is necessary for institutions and individuals to work on what may be deceptive acts. Fraud does not only lead to the loss of property of the victim but at the same time restricts the freedom of the will to decide the freedom of the will of the individual because of deceptive movements.

Although economic crimes are considered to be real persons today, it is possible that these crimes can be processed through private sector institutions or against these institutions, especially negative effects on market economy are seen. For example, credit and insurance fraud is a serious

---

*Nigde Ömer Halisdemir University, Faculty of Economics and Administrative Sciences, Department of Public Finance, Central Campus, 51240, Nigde recepkhrmn@gmail.com*
economic loss especially for banks and insurance companies. The increase in these losses is a major factor in organizing economic crimes as collective crimes. Due to the large number of offenders, the crime is uncovered and therefore the effective fight against crime cannot be carried out easily compared with other crimes. (Tiryaki ve Gürsoy, 2004: s. 53)

In the name of effective fight against corruption offenses, the Law No. 3628 on Declaration of Commodity, Anti-Bribery and Corruption Law was adopted. Along with this law, corruption offenses are regarded as target offenses under a separate law. This situation is important for the formation of a certain form of struggle: Public officials must report their property on time. If they are notified of unjustified goods, they will be punished. There is no need to obtain permission from the upper authority to initiate an investigation if economic crimes are committed.

Because of the legal benefit protected by economic crimes, the crime is not only economically appropriate for the effective struggle against crime. For this reason, economic sense of economic punishment should not be interpreted strictly. For example, in the crime of extortion, the public officer uses the influence of the mission. The power provided by the officer is useful to him or herself by abusing the authority. In this case the public official provides economic benefit for the crime. The trust in public administration is reduced because of this benefit. The damage to the functioning of the public administration should be considered to be much greater than the economic benefit provided when the unfair benefit provided by the public officer is compared to the damage suffered by the public administration.

1.3. Types of Economic Crime

There is no concrete type of crime that meets the economic crime. Rather than defining the crime, it is preferred to disclose the concept by ranking the basic principles that satisfy the economic crime. In this case, it is possible to form subtitles by forming the title as an economic crime because it is a common law subject. It is possible that different subcategories of economic crime can be defined as financial crime, white collar crime, corruption crime, commercial crime, smuggling crime, and tax evasion according to the subject. The concept of economic crime, such as corruption, which is included here, also includes concrete crime types, which do not constitute a specific type of crime.1 As you can see, subcategories of the concept of economic crime are mainly included as top headings in criminal law. Indeed, the fact that the

---

1 In the case of corruption, the authority given by the public authority in the performance of public activity in general is abused. The personnel who are obliged to use this authority do not use it in the direction of the society, but use it as a vehicle in its own or others’ interests. In the Turkish Criminal Code numbered 5237 there is a crime offense against the credibility and functioning of the public administration. Under this head, a number of corruption offenses such as embezzlement (Article 247), extortion (Article 250), bribery (Article 252), trade of influence (Article 255), abuse of duty (Article 257). In corruption crimes, which constitute a significant part of economic crime, it is desirable to protect the trust of the public to the public administration beyond the property of the society.
sub-title concepts are included in the law as the top headings of the crime types show how wide and complex the scope of the concept of economic crime is. (Tiryaki ve Gürsoy, 2004: s. 54)

Smuggling crimes generally occur in commercial transactions. The contractor’s purpose is to reduce the cost of the job. In this case, the economic crime occurs because it does not fulfill the obligations such as the tax that should be paid to the public administration. For example, the gain obtained is low. Or it shows that the goods taken by arranging forgery are of different quality. In this way the person is aiming to get rid of the tax burden. Smuggling crime types, tax evasion, fuel smuggling, cigarette smuggling can be given as an example. The main purpose of this crime with this type of crime is to be completely economical, in order to reduce the revenue losses of the public administrations and also to protect the market competition. (Tezer, 2005: s. 30)

Money forgery as a type of economic crime In the Turkish Penal Code No. 5237, the article titled Crimes Against Public Trust was issued in 197. Likewise, in Article 282, a criminal offense was laid to launder the value of property originating from the crime. The concealment of criminal interests, the removal of the country from abroad, or the use of the market in a manner that disrupts economic competition conditions is prevented. With this crime, gains from bribery, tax evasion and other crimes are missed. As a result of concealing the money from the public administration the income of the beneficiary is negatively affected. (Dursun, 2005: s. 221)

Most of the economic crimes are organized in specific criminal laws, not in Turkish criminal law, such as insurance, customs, tax, capital market and banking. The inclusion of these offenses under their separate laws is among the general principles of economic crime. The material and moral elements and sanctions of economic crimes are contained in special criminal law. However, part of the general provisions of the Turkish Penal Code shall apply to the parts such as attempt, partipation.

1.4. Fraud as a Type of Economic Crime

Fraud is regulated in Article 157 of the Turkish Penal Code No. 5237 titled Crimes Against the Property of Part II of the Second Book. The fraud (truffa) is regulated in the Italian Penal Code in the second chapter of property offenses (dei delitti contro il patrimonio). The fraud (betrug) is regulated in the German Penal Code entitled Fraud and Trust Abuse in Chapter 22.

Fraud is the crime of economic crime due to the economic effects of crime is studied among economic crimes. Since the fraud was organized in the Turkish Criminal Code numbered 5237 as Crimes Against Property, the criterion in the criminal classification of the criminal law should be seen as a directly protected legal benefit. However, due to fraud, it is economical to have a broader effect on the cause of the victim. On the other hand, if it is necessary to clarify the matter, even in the case of bribery, the criminal effect is economic, but it is included
in the crime against the legislative public administration. As a result, the fraud as an the eco-
nomic crime does not directly harm the life of the person, the life, the rape but is economi-
cally harmful. It may be any movable or immovable property belonging to the subject of the
fraud. (Maviş, 2015: s. 601)

In Article 157 of the Turkish Criminal Code numbered 5237, the crime was organized as a
basic state. Qualified cases are regulated in Article 158. The basic state of crime directly cre-
ates negative consequences for the assets of the individuals. Qualified cases often include comp-
plicated and organized fraud cases. From this point of view, qualified cases are in conformity
with the model of economic crime. Qualified cases adversely affect the market economy. For
this reason, by using the deterrent effect of legislative punishment, these situations are linked
to more severe sanctions.

Second Part
Elements of Fraud and Completion of Crime

1. Elements of Fraud

1.1. General Explanations

In criminal law, elements of crime are divided into material elements and moral elements. Move-
ment, the perpetrator and the victim, criminal matter are the material elements of the crime
scandal. The moral element is intention.

1. 2. Legal and Material Subject

In the law 5237, fraud is organized in crimes against property, so the legal value protected by
crime is the property value of the person who has priority. In Italian penal code it is also clear
that the value protected by crime because of the title of property crime is preventing the de-
crease in the value of the property of the person. (Tezcan vd., 2015: s. 701). In addition to the
protection of property values in the case of fraud, the will of the person being duped is also di-
rectly affected by the crime. It is taken away by the person who deceives the freedom to man-
ifest his will on those he possesses or represents. For this reason, the freedom of one’s will is
also protected. (Özbek vd., 2017: s. 704)

The judgments made by the doctrine concerning the criminal law are accepted by the Court of
Cassation as well: “Fraud is the act of guilty, deceiving and disciplining a person to the point
where he or she can make an unfair advantage to himself or to someone else at the expense of
his or others. This crime is a two-point crime, besides property, the will of the person is free
and the freedom of consent is also protected. Because the delivery of the goods in the case of
fraud occurs with permission of the victim. But this is based on a non-free will that has been disabled using deception and delivery.” (CGK. 24.12.2002, E. 2002/6-306, K. 2002/441).

The material aspect of the fraudulent offense is the value of the property of the person. Movable, immovable assets and receivables with economic value constitute the subject of crime. The values listed here are the values of the property of the person. However, these values need to be considered broadly. For example, the right of property and the right to use a property right itself constitutes a matter of crime. The main reason why the subject of the crime is not narrowed is to be able to effectively combat the crime of fraud. (Toroslu, 2018: s. 179)

1.3. Offender and Victim

Bribery and embezzlement are crimes specific crimes that the public official can be a perpetrator. However, fraud is not a crime specific crime or liability. Since no limit is accepted in terms of criminal offender, every person can have fraudulent acts in fraud crime. 2 In accordance with the expression "benefiting to himself or others" in his law no. 5237, the offender must not be the same person as the beneficiary. (Gökcen ve Balcı, 2008: s. 13). The victim is the person who has dominance over the legal subject of the crime. (Toroslu, 2009: s. 95) The person who is deceived in the crime of fraud is the passive subject of the crime. This person may be the owner of the property or it may be the representative of the owner of the property. In this case, the person who is deceived as a victim, and the person who is damaged is regarded as a person whose property values are decreasing. (Özgenç, 2002: s. 30)

1.4. Movement

The act of fraud should have a certain quality. The lawmaker used the statement of fraudulent motion as the crime movement element. The fraudulent act is the person to be deceived. For this reason, the movement must be directed to the person to be deceived. In other words, there is no crime if the fraudulent act has no contact or if the victim does not. It is necessary to find a direct causal link between the deception of the victim and the fraudulent actions of the perpetrator. In the absence of a bond, the victim is automatically deceived in this case and the crime does not occur. (Özbek vd., 2017: s. 706)

In the following cases fraud does not occur due to lack of fraudulent action. 1) The customer who tries to wear clothes in the store throws away the clothes that he has tried and goes away. In this case fraudulent act does not occur due to lack of fraudulent act, but because someone

---

2 The possession of the will of the will is not included in the material element of the offense. Will ability is the power of one to distinguish between right and wrong and is evaluated after the elements of the crime are formed. For example, a person who does not have a verbal ability can be a criminal offender and in this case a crime occurs. However, he is not punished because he does not have a faulty license.
else takes the goods without a reason, there is a theft. 2) If you leave your account without paying after eating an expensive restaurant, fraud will not occur because there is no fraudulent activity. Fraud does not occur since customers who have moved away from the hotel without paying the fee after they have stayed in an expensive hotel are not fraudulent. There is also no crime in these two cases. However, there is a liability for compensation due to the breach of contract between them in the sense of private law.

Because of the trick, the will of the victim should not be free. For this reason, fraud is not a crime as long as there is no trick, which is the adjective element of the movement. (Toroslu, 2018: s. 178) It is not required that the fraudulent movements in the Law 5237 be able to fool the other side. It is deemed sufficient to deceive the other side. Despite not being in law, fraudulent movements must be able to deceive the other side. Because the relationship between fraudulent movements and the victim’s illusion is necessary. (Selçuk, 1986: s. 86)

Fraudulent movements are active or passive. (Centel vd., 2007: s. 456). In the name of fighting fraud, the lawmaker accepts the existence of trick in universal criminal law. However, there is no restriction on this trick. (Dönmez, 2004: s. 453)

According to the Court of Cassation, trick is not material. Fraudulent movements may be in the form of demonstration or in the form of silence. He is silent when he is obliged to explain, concealing his own situation in not disclosing his true will. For example, the customer who comes to the carpet store looks at the carpet in the window and says he finds a hand weaving carpet. If the seller who hears this is a machine carpet, but if he sells by silencing with deceitful intent, a fraud crime is committed. But lying is not enough to commit fraud. The person who lied must act with the intention of committing a crime. (CGK, 27.04.2004, E. 2004/6-85, K. 2004/104)

In the justification section of Law No. 5237, the characteristics of the trick are clearly stated. The trick can be done with an executive behavior. The trick can come from a mistake that the other party falls into. The trick can be born because the other party has the wrong information on a topic. However, in this case, one must have an obligation to inform the other party of the failure. There is an obligation in the legal relationship. In addition, the negligence of the person in the face of the client’s mistake, must bear the value of the disclosure. (Dönmez, 2004: s. 450)

1.5. Moral Element

A fraud can only be committed intention. The offender must have awareness and willingness over the entire material element of the offense. First of all, the offender should know that his movements are fraudulent and that he is able to deceive the other side. The offender should
also know that the other side will be reduced in assets and that offender’s assets will increase. In other words, between increase and decrease must be aware of the link. (Toroslu, 2018: s. 184)

2. Completion of the offense

2.1. General Explanations

Because fraud is considered as a crime against property, it is necessary for the criminal to have a change in favor of the perpetrator in order to complete the crime. The intention is not only to capture the will of the victim but to obtain the benefit that leads to an increase in his wealth. Since fraud is not a figural offense but a harm offense, a causal link should be established between the act and the conclusion. For this reason, the completion of the crime must be directly proportional to the benefit obtained. (Selçuk, 1986 s. 75)

2.2. Completion Time

2.2.1. General Explanations

Since fraud is not just an act of guilt, the existence of fraudulent acts is not enough to complete the crime. In the crime of fraud, the three situations must arise interdependently. The three cases mentioned can be expressed as two consequences of fraud. Depending on the fraud, the victim should be deceived and the unfair benefit should be obtained depending on the fraud. First, the offender’s move must be fraudulent. Secondly, the victim must be deceived. In other words, the first cause of fraudulent activity is victimization deception. And then, as a result of this deception, a direct result must come forth. This is the result that the lawmaker is looking for. As you can see, the victim’s deception must take place before the perpetrator's assets rise. (Dönmez, 2004: s. 466)

Similar or different expressions are used in penal codes for completing a fraud. According to the law no. 5237, it is completed with the benefit to himself or others. (Tezcan vd., 2015: s. 718). According to the Italian Penal Code, it is completed by providing unfair advantage to himself or to others. According to the German Criminal Code, it is completed if it harms another person in order to benefit for himself or others. It is seen that the Turkish and Italian criminal laws use the same expressions regarding the time of completion of the offense. In the German criminal law, the completion of the crime is linked to the damage of the victim, not to obtain the benefit. There is an increase in the assets of the offender depending on the damage of the victim. For this reason, damage to the victim in German law must be interpreted as a direct result of the failure. (Toroslu, 2018: s. 187)
2.2.2. Obtaining Benefit

The benefit is that the value of the property goes out of the victim's sovereignty area and falls into the sovereign territory of the offender. Whether or not he has sovereignty ability is determined in order to be able to understand that he is the beneficiary. In other words, the offender must have the power to consume a lot. The time of inclusion in the power of sovereignty varies according to the type of property. If the mentioned benefit is carried, it will be beneficial to obtain actual domination. If it is not immovable, it is benefited by passing ownership. (Hafızoğlulları ve Özen, 2010: 374)

In terms of punishment, the legislator does not have a special preference. The benefit may be obtained directly or indirectly. This is because the criminal code clearly used the expression that would benefit either you or someone else. The timing of the completion of the crime can change. If the beneficiary is in favor of the offender, then the crime is completed when he is included in his sovereignty. If the benefit is in favor of the third person, the crime is completed when the third person is thrown into the field of sovereignty for the completion of the crime. It does not matter whether the benefit is temporary or permanent. Even in cases of temporary use, a fraud crime occurs. If they were not punished, the negative situation would arise in terms of fighting crime. Otherwise, it would not be possible to punish those who intend to temporarily benefit.

The Italian penal code clearly used the unjustified utterance, while there was no statement in the Turkish penal code regarding the lack of interest in the benefit of the fraudulent offense. In Article 159 of the Turkish Penal Code, it is stated that the criminal penalty is reduced if fraud is committed in order to collect a claim based on a legal relationship. It is not an unjustifiable benefit for a person to obtain his or her receipt. It is not important that the benefit of crime in the Turkish Penal Code is justified or unfair because it is accepted as a reason to reduce the responsibility for fraudulent processing of the fraud. (Tezcan vd., 2015: s. 719).

It is sufficient to benefit from completing the crime and it is not necessary for the offender to actually use. Because the lawmaker preferred the expression that provides the good. The later savings changes that you have achieved will not cause another crime to occur. For example, the offender of the fraudulent criminal who took over the mobile phone by deceiving the other side. Later, if you throw this phone into the sea, you can not be held responsible for the damage of the property.

2.2.2. The Existence Of Damage

The victim makes mistakes, depending on the franchise created by the offender in fraud. As a result of this mistake he is suffering himself. In order for the victim to be harmed, the offender must benefit. Damage is a reduction of existing values and should not be regarded as
a loss of values that they expect to achieve in the future. In other words, if the expectation of future earnings is left in the middle, it does not constitute a crime in terms of fraud. (Toroslu, 2018: s. 192)

The Turkish Penal Code calls for the victim to be harmed as a result of the perpetrator’s gain. It is not a crime if the victim does not suffer damage although the victim gains the benefit. The damage suffered by the deceived or the third person is regarded as a concrete decline in the total wealth of these persons. Economic losses are included in the loss. Decreasing their moral values is not a matter of guilt. (Özbek vd., 2017: s. 710)

2.3. Attempt

If the crime is begun to be carried out, but it is not halfway, or if it does not come to an end, it will be an attempt. In this case, it is the damage or danger which is caused by the punishment of the person by the legislator. The punishment of the offender in the attempt shows that the field of responsibility expands. However, as it is seen in the definition of attempt, for the fraud, it is necessary for the person to start the movement first. (Özbek vd., 2017: s. 724)

Fraud starts with fraudulent acts of crime. The attempt is entered into the field of punishment. There are two possibilities for which the attempt may be punished for fraud. In the first case, the victim was not deceived although it was entered into the field of attempt. In this case, the movements will be left unattended, so they will be held accountable for the attempt. In the second possibility, the offender entered the criminal enforcement action and completed it, but it did not come to a conclusion. In this case, the offender, despite being deceived by the victim, was unable to obtain the benefit. In other words, the victim was not damage despite the deception. In this case, even though the execution movements are completed, the result does not come to the conclusion and it is attempted.

It is not the same concepts that motion is convenient and sufficient. The movement must be absolutely convenient in order to be able to attempt the crime of fraud. For this reason, the movement must be capable of deceiving the other side. Otherwise it will be an irreparable crime, not an attempt, because the movement is not convenient. Whether or not fraudulent

---

3 According to the Court of Cassation, since they do not pay phone bills, their subscriptions have been canceled. Those whose phones were canceled put their own photographs into the identities of others using false identification. Together with these identities, they have applied for free use of telephone services. However, it is understood that the identification of the identity is false. In this case, fraud was attempted because the victim was not deceived although the movements were fraudulent. (11. CD. 22.03.2007, 5059/2035)

4 According to the Court of Cassation, the state of being unable to obtain benefits is regarded as an attempted criminal offense. The perpetrator goes to the workplace of the victim and identifies them as policemen in the financial center. They show a fake ID and indicate in their file on file that there are irregular bills belonging to the company. The victim says they want to examine the documents and that a high amount of punishment will follow. The victim wants to spend time preparing the money by fearing the punishment. The police then move away to get the money the next day. The victim will notify the police and arrest them. (6.CD. 03.07.2007, 10569/8369)
action is appropriate for objective assessment should be determined by the judge in the specific case. Inadequacy of movement may be convenient to the movement, but the other side is not deceptive and may lead to attempt. Because if it was enough, he would have deceived the other side. (Centel vd., 2007: s. 533).

In the case of fraud, the two possibilities of the attempted act, the withdrawal of movement, or the failure of the conclusion of the cause, should not be the result of the will of the offender. In other words, if the perpetrator has left the fraudulent movement with his own will or has not obtained the benefit, then the voluntary abandonment occurs, not the attempt. (Toroslu, 2009: s. 266)

**Conclusion**

The concept of economic crime is a contemporary field protected by universal criminal norms in the developing world. The special meaning of this area in terms of criminal law is that it is not possible to reveal economic crimes with typical crime combat methods. It is always difficult for law enforcement to find out whether damage is caused only by the damage to the economic area of the quiche and whether the crime is completed or not. One of the most important parts of economic crime is fraud. The main reason why fraud is regarded as economic crime is that there is no attack on the victim's body, life, sexual immunity. The attack by the perpetrator is only the value of the property that the person possesses.

Completion of the crime in criminal norms is not expressed as deception of the person. The moment when the offender obtained the benefit was accepted. The system of the legislator is correct in terms of protected legal benefit. The system of the legislator is correct in terms of protected legal benefit. The value of property is protected in preference to the freedom of one’s will.

Fraud is separated from crime against other assets in the manner of criminal conduct, crime protected value and criminal completing. On the other hand, values that are economic terms with the other expression, including the property of the person, constitute a blame. Concepts that do not have economic value, even if the moral value is excessive, can not be a matter of crime.

In the case of fraud, the offender causes the victim to make a mistake. In this way, decision making will lose control over the affected person’s assets. As a result, there is a willingness to pass on the value that the perpetrator possesses dominance. Fraud is completed with the benefit of the crime being obtained. However, the damage must be born with the benefit obtained. In this case, it must be determined whether the damage occurred in the concrete case. Damage must also be economical with the benefits provided.
References

CENTEL, Fatma Nur, ZAFER, Hamide ve ÇAKMUT, Özlem (2007). Kişilere Karşı İşlenen Suçlar, İstanbul: Beta Yayınları

DÖNMEZER, Sulhi (2004). Kişilere Ve Mala Karşı Cürmüler, İstanbul: Beta Yayıncılık


ÖZGENÇ, İzzet (2002). Ekonomik Çıkar Amacıyla İşlenen Suçlar, Ankara: Seçkin Yayınevi

SELÇUK, Sami (1986). Dolandırıcılık Cürmüünün Kimi Suçlardan Ayırımı Ve Çeklerle İlgili Suçlar, Ankara


TEZER, Ercan (2005). Ekonomik Suç ve Ceza Sempozyumu, Ankara

TİRYAKİ, Tercan, GÜRSOY, Türker (2004). Ekonomik Suç Kavramı ve Sigortacılık Suçlarının Bu Açidan Değerlendirilmesi, Sayıstay Dergisi, Sayı 55, s. 53-68


PART V

PRODUCTIVITY
1. INTRODUCTION

In the macroeconomic theory, there are efficiency wage model, bargaining theory and job search model and contract theories, revealing a close relationship between the productivity and real wages. As the productivity and real wages are two important factors of labor market, they have an important place in the economic literature. An increase in the labor productivity gives acceleration to the economic growth by increasing production, and consequently, the employment increases. On the other hand, an increase in the productivity therefore plays an important role in the competitive power by decreasing production costs and prices. Moreover, a decrease to be arisen in the prices as a result of productivity takes an important role in the social wealth’s increase. An increase in the productivity also causes the GDP to increase, by increasing the production per output. Thus, the positive developments arise from the growth of increased productivity and decreased unit cost effects. The scale economies’ effect created by an increase in the productivity is discussed herein. The changes happen to the wages following the productivity increase. The labor market’s existence has a quite important place in terms of both the microeconomy and macroeconomy. The macroeconomy generally reveals the relationship’s causality between the real wages and productivity. Determining the relationship between these variables brings an important light to the policymakers. Our study’s main purpose is to test the relationship between the real wage and productivity; in other words, whether there is a significant relationship between the variables. For this purpose, a time-series analysis was performed by using Turkish industry’s data onto 2007:1 and 2017:3. ARDL Test (Bound Testing Approach) and Granger causality test were used in the analysis. The study consists of 6 sections. In the second section, the theoretical relationships are explained between the real wages and productivity. In the third section, the findings are mentioned for the previously performed empirical studies testing the relationship between the real wages and productivity. In the fourth section, the explanation is made for the data used and method to be applied. In the fifth section,
the analysis and empirical findings are discussed. In the sixth section, the obtained results are evaluated and construed.

2. RELATIONSHIP’S THEORY BETWEEN PRODUCTIVITY AND REAL WAGE VARIABLES

To develop a country, the production should increase in that country. So, an increase is expected for the firms making the production of both the domestic market and foreign market. The low-cost and high-quality goods’ production and productivity have an important place in the competition by increasing the firms’ productions. On the other hand, wages paid by the firms to their employees have a great importance in terms of both the firms and working laborers. Because, as the firms consider a wage to be given when they employ the laborers, the laborer considers a wage that the employer consents to give them. The relationship between the productivity and wage has a great importance in terms of both the employer and laborer herein. When we consider the employers, they desire to obtain more production by employing more efficient laborers. The laborer requests a wage as part of the contribution to production. When we view from this aspect, the productivity and wage concepts constitute two important factors of the labor market. The developments in the labor market affect the goods and services market and therefore the whole economy, in both the micro and macro levels. Due to this reason, the productivity and wage concepts excited an attention to the economists in the economic literature and prompted the economists to study in these fields. Many macroeconomic theories such as efficient wage, wage bargaining, and contract theories try to explain the relationship between the productivity and wages (Wakeford, 2004, p.109).

The productivity concept is frequently explained by the marginal productivity concept in the economic theory. The marginal productivity is expressed as a contribution to the last unit labor for the production. However, the main labor productivity concept is preferred, when it is referred to the labor’s productivity. Because, determining labor’s marginal productivity is quite difficult. The labor’s main productivity is calculated by dividing the total production into total labor. However, the main labor productivity at macro level is obtained by dividing the GDP into the number of working person (the number of employed person in the economy (Parkin, 2010). When we view the wage from an economic aspect, the wage is a price obtained in return for the labor’s contribution to the production. While the nominal wage is a payment made in return for the labor’s service, the real wage is the goods and service amount to be bought with the income obtained by labor (Parkin, 2010).

While Wakeford was expressing the causality relationship between the productivity and wages in 2004, the performance-scaled payment was tried to be explained based on the wage bargaining and efficient wage theories (Wakeford, 2004).
The classical economists reveal that the labor is homogeneous and the labor’s productivity is not affected by the change occurring to the real wages. The real wage was being determined as the intersection point of labor-supply and labor-desire curves, according to the classics. The classics accept the unemployment as a voluntary unemployment arising from the labor market, and this concept is interpreted that the persons present in labor markets prefer becoming unemployed rather than working with the real wage determined in the market. However, the current Keynesian opinion, which is the extension of Keynesian opinion arising as a result of the insufficiency of classical theory and arose in the mid-20th century, expressed that the change in real wages affected the labor’s productivity. The current Keynesian opinion revealed the Efficient Wage Theory expressing that the productivity increased depending on the firms’ wage payment made to the laborers more than the equilibrium wage.

The Efficient Wage Theory is basically based on an assumption that the employees’ productivity is conditioned by the real wages. In this case, the firms accept to make a payment to the laborers more than the equilibrium wage (Katz, 1986, pp.235–290). This theory reveals that the increases in the real wage create an increase in the productivity. An increase arising from the productivity is attributed to the work of more qualified laborers and higher performance shown by the laborers (Greenwald & Stiglitz, 1993, pp.23-44; Weiss, 1980, pp.526-538; Yellen, 1984, pp.200-205).

The firms make a payment more than the market equilibrium wage in order to provide the laborers to work more, due to their fears to lose a good job according to the Efficient Wage Theory. However, if finding a new job easily by the laborers in the labor market is discussed, the demission threat is not an effective factor to prevent shirking factor. If the firm makes a higher payment more than the other firms, the laborer does not select to shirk. Therefore, making an efficient wage payment to the laborers prevents shirking (Snowdon & Vane 2005, pp.386-397; Shapiro & Stiglitz, 1984, pp.433-444). In conclusion, the efficient wage paid to the laborers increases the laborers’ productivity. The productivity is expected to increase, as a result of working more by the laborers. In this context, a positive causality is discussed from the wages to the productivity (Pazarlioglu & Cevik, 2007).

A decrease in the real wages decreases the laborers’ working level and labor’s productivity, according to the Efficient Wage Theory. Therefore, the firm’s profitability decreases (Yellen, 1984, pp.200-205; Katz, 1986. pp.235-290; Carmichael, 1990, pp.269-295; Bradley, 2007, pp.167-188). The firms herein desire to increase the laborers’ productivity by increasing the laborers’ working requests and efforts and the real wage level paid to the laborers in order to increase their profitability. However, the real wage increases begin decreasing the laborers’ productivity for a while instead of increasing, when the law of diminishing returns shows-up. In this case, the firms targeting the profit maximization make a payment equal to the optimum wage level.
and marginal efficiencies, and this wage level is therefore called as the efficient wage level (Carmichael, 1990, pp.269-295; Heijdra & Ploeg, 2002; Abel & Bernanke, 2005).

When the unions make a wage bargaining, they consider the performance according to the Wage Bargaining Theory. Therefore, the wages are expected to increase, based on an increase in the productivity. In other words, the causality is discussed in a positive direction from the productivity to the wages.

The wage is determined based on the mutual bargaining powers of laborers and employers according to the Wage Bargaining Theory. In this context, organizing the laborers in their unions increases their bargaining powers. However, the laborers’ subversion decreases their bargaining powers. Therefore, the laborer unions’ bargaining power to be made for the wage has a great importance in terms of being provided a balance in face of the employer. Because, when this condition is discussed, the laborer’ wages increase in the labor’s productivity criterion (Seyidoğlu, 2002, p.680).

When the potential competitors decrease in the periods in which the unemployment rates are low, the real wages increase, as the unions’ wage increase requests and acceptance possibilities of them are high. However, the real wages are expected to decrease, as the unions’ bargaining power decrease in the periods in which the unemployment rates are high.

The highest level to be reached by the wages is determined in a certain employment level according to the marginal productivity theory. The level determined is attributed to the productivity. If the productivity increases, the wage level increases; and if the productivity does not increase, the wage level does not increase. There is a positive causality herein from the productivity to the wages. In other words, the causality’s direction is from the productivity to the wages. However, there is an unforeseen correlation between the productivity and wages in this theory.

The production and supply increase as a result of increasing the employee’s productivity, and the supply’s increase decreases the prices. A decrease in the prices increases the employee’s income and wage.

The real marginal income produced by the labor is suggested to being explained. There is a close relationship between the real wages and output amount per employee (labor’s productivity). The changes’ short-run effect on the productivity is approximately 0.6 in terms of the real wages. In other words, a 1-unit change into the productivity changes the real wage at the rate of 0.6. This condition reveals that the changes in labor productivity are fed by the rapid real wage growth (Castle & Hendry, 2014, pp.163–197).
3. EMPIRICAL STUDIES RELATED TO RELATIONSHIP BETWEEN REAL WAGE AND PRODUCTIVITY

Sargan analyzed a relationship between the real wages, output per person, inflation and unemployment by using the vector error correction model, in the study performed in 1964 (Sargan, 1964).

Hall tried to reveal whether there is a long-run relationship between the productivity, wages, and unemployment variables by using the quarterly data of England between 1963 and 1984, in the study performed in 1989. In the study, a long-run relationship was revealed between productivity, wages, and unemployment variables by using the Engle-Granger cointegration test (Hall, 1986, pp.229-239).

Alexander researched a long-run relationship between the productivity, wages and unemployment variables by using the quarterly data of English economy for the period 1955-1991, in the study performed in 1993. In the study, the data set was analyzed by dividing them into two periods as a result of the determination of structural breakage in 1979. In the analysis, the Johansen cointegration test and Granger causality test were used. The productivity was determined in both periods as a result of the study (Alexander, 1993, pp.87-102).

Hondroyiannis and Papapetrou researched a cointegration relationship between the inflation, productivity, and unemployment by using the annual data of Greece economy for the period 1976-1992, in the study performed in 1997. In the research, the structural breakage was determined in 1986 and the data set was divided into two periods, including the periods 1976-1986 and 1986-1992 in this context. The cointegration relationship was determined by three variables for both periods as a result of the study (Hondroyiannis & Papapetrou 1997, pp.235-247).

Terzi analyzed a long-run relationship’ existence of the cointegration test by using the data onto Turkish Manufacturing Industry for the period 1950-1991, in the study performed in 1997. While there was not a cointegration relationship between the productivity and wage for the public sector as result of the study, the cointegration relationship was determined by these two variables for the private sector (Terzi, 1997, pp.7-20).

Metin and Üçdoğan tried to reveal a long-run relationship’ existence with the cointegration test by using the data of Turkish Manufacturing Industry for the period 1962-1992, in the study performed in 1998. It was determined that the wages indirectly depended on changes in the price and employment and there was a relationship between the real wages and employment level and this relationship’s direction was from the employment to the real wages, as a result of the study (Metin & Üçdoğan, 1998, pp.279-287).

Diboğlu and Enders researched whether there was a long-run relationship between the real wages, productivity, and unemployment by using the annual data of Canada and the USA
Productivity and Real Wage Relationship in Turkey: Cointegration and Causality Analysis

Sevilay Sarica

Economies for the period 1973-1988, in the study performed in 2001. The cointegration relationship was determined by these three variables, as a result of the study (Diboğlu & Enders, 2001, pp.495-515).

Marcellino and Mizon researched a long-run relationship’s existence between the real wages, output per person, inflation and unemployment by using the data of Italy economy for the period 1970-1994, in the study performed in 2001. In the research, the structural breakage was determined in 1980 and the data set was divided into two periods, including the periods 1970-1979 and 1980-1994 in this context. The cointegration relationship was determined by four variables in both periods as a result of the study (Marcellino & Mizon, 2001, pp.359-370).

Welfe and Majsterek analyzed a long-run relationship’s existence with the cointegration test between the wages, prices, and productivity by using the data of Poland economy for the period 1992-1999, in the study performed in 2002. The cointegrated relationship’s existence was revealed by three variables as a result of the study (Welfe & Majsterek, 2002, pp.205-219).

Bruggemann reviewed the relationship between the productivity, unemployment and real wage by using the data of German economy for the period 1970-1998, in the study performed in 2003. In the analysis, the vector error correction model was used. The cointegration relationship was determined by the variables as a result of the study (Bruggemann, 2003).

Wakeford analyzed whether there was a long-run relationship between the productivity, wages, and unemployment by using the quarterly data of South Africa economy for the period 1983-2004, in the study performed in 2004. In the analysis, the data set was divided into two periods, including the periods 1983-1990 and 1990-2004 as a result of determining the structural breakage in 1990. The cointegration relationship was determined by the variables for both periods as a result of the study (Wakeford, 2004, pp.109-132).

Christopoulos and Tsionas researched whether there was a cointegration relationship between the productivity and inflation by using the data onto 15 European Union countries for the period 1961-1999, in the study performed in 2005. The cointegration relationship was determined by the productivity and inflation as a result of the study (Christopoulos & Tsionas, 2005, pp.137-150).

Kumar, Webber and Perry researched a relationship between the real wages, inflation, and labor productivity by using the data onto Australia for the period 1965-2007, in the study performed in 2012. In the analysis, the structural breakage was seen in 1985. In the analysis, it was determined that an increase of 1% in the manufacturing industry’s real wages caused to an increase between 0.5% and 0.8% in the manufacturing industry’s productivity. On the other hand, the Granger causality test was used in the study, and both the real wages and inflation
was revealed that they caused to the productivity in a long-run as a result of the test (Kumar, Webber & Perry, 2012, pp.2945-2954).

Yamak and Küçükkale researched whether there was a long-run relationship between the real wage and labor productivity by using the data onto Turkish Manufacturing Industry for the period 1950-1993, in the study performed in 2000. In the study, a long-run relationship was shown between the real wages and labor productivity by using the Johansen and Juselius test (1990). The elasticity of substitution's coefficient was estimated at 1.24 in this long-run relationship, and this value was quite greater rather than the values obtained in the other studies (Yamak & Küçükkale, 2000, pp.26-33).

Moschos tested a reaction that the prices gave to the wage and productivity changes both in a short-run and long-run by using the data onto USA economy for the period 1951-1978, in the study performed in 1983. A long-run relationship was revealed between the price, wage, and productivity as a result of the study. On the other hand, the wages' effect on the prices was stronger than the productivity in a short-run as a result of the analysis (Moschos, 1983, pp.169-175).

Welfe reviewed a relationship between the price and wages by using the data onto Poland economy for the periods 1964-1989 and 1990-1993, in the study performed in 1996. The nominal wages were revealed that they were determined by the labor productivity and prices as a result of the analysis. Moreover, working prices were determined that they were designated by an increase rate of the wages and imported goods' prices (Welfe, 1996, pp.33-50).

Çetin and Bakırtaş researched whether there was a long-run relationship between the annual main real wage, growth rate and annual labor productivity's growth rate by using the annual data of OECD member 34 countries for the period 2000-2010, in the study performed in 2014. In the study, the Panel Cointegration analysis was used. The cointegration relationship was revealed between the main real wage growth rate and labor productivity's growth rate as a result of the analysis. In other words, an increase in the main real wage and growth caused to an increase in the labor productivity and growth (Çetin & Bakırtaş, 2014, pp.173-186).

Türkyılmaz and Özer researched whether there was a long-run relationship's existence between the employment, real wage, productivity, prices and unemployment rates by using the Johansen cointegration test and the monthly data of Turkey for the period 1988:10-2004:03, in the study performed in 2008. All variables were determined to be cointegrated as a result of the study. Moreover, a positive relationship was revealed by the real wage and productivity and real wages and unemployment rate, as a result of the analysis (Türkyılmaz & Özer, 2008, pp.175-189).

Pazarlıoğlu and Çevik investigated whether there was a long-run relationship between the productivity, real wages, and unemployment rates by using the data of Turkey for the period
1945-2005, in the study performed in 2007. In the study, the Johansen cointegration test and Granger causality tests were applied, and a long-run relationship was determined by the variables as a result of the study. On the other hand, a two-way causality was determined by the productivity and wages (Pazarlıoğlu & Çevik, 2007).

Güneş tested a relationship’s existence of the productivity and real wage with the cointegration analysis by using the quarterly data of Turkish manufacturing industry for the period 1988:01-2006:02, and a long-run relationship was determined by the productivity and real wages, in the study performed in 2007 (Güneş, 2007, pp.276-287).

Lopcu, Kaytancı and Ateş tested a foresight that the marginal productivity of real wages and labor equalize in a long-run period by using the annual data of Turkish Manufacturing Industry for the period 1963-1998, in the study performed in 2010. In the study, the total Turkish Manufacturing Industry was discussed as the public sector and private sector. The results reached by using the panel data method revealing that the productivity was not in an equalization tendency towards the real wages in large part of the manufacturing industry of public and private sector (Lopcu, Kaytancı & Ateş, 2010, pp.99-114).

Marquetti researched a long-run relationship between the productivity and real wages by using the data of the USA for the period 1869-1999, in the study performed in 2004. A long-run relationship was determined by the productivity and real wages, in the study in which the cointegration analysis was performed (Marquetti, 2004, pp.432-441).

Fedderke and Mariotti investigated a relationship for the period 1970-1997 between the labor productivity and real wages. 48 sub sectors of South Africa were discussed by the study performed in 2002. The sectors, of which labor productivity increased, were revealed that they reflected this increase in the real wages to a large extent as a result of the study (Fedderke & Mariotti, 2002, pp.830-864).

Özmucur tested a relationship between the productivity and wages by using the data onto Turkish manufacturing industry for the period 1950-1998, in the study performed in 2003. A close relationship between the wages and productivity was determined as a result of the study, in which the three-step least squares method was applied to the time-series (Özmucur, 2003).

Kamacı researched a long-run relationship between the real wage, inflation and real interests and labor productivity by using the annual data of 11 OECD countries for the period 1993-2013, in the study performed in 2016. A unidirectional causality from the real wages to the labor productivity and a two-way causality between the inflation and labor productivity were determined in the study, in which the Pedroni Panel Cointegration test and Granger causality test were performed. In other words, while an increase was increasing the labor productivity, an increase in the labor productivity increased the inflation (Kamacı, 2016, pp.321-340).
Appelbaum and Schettkat investigated a relationship between the wages and productivity for the period 1979-1989 by using the data of 11 sectors of Australia, in the study performed in 1995. The relationship between the wage and productivity was revealed to be poor in the end of the study (Appelbaum & Schettkat, 1995, pp.605-624).

Volgy, Schwarz and Imwalle researched a relationship between the real wages, inflation and labor productivity for the period 1960-1990 by discussing data of 10 developed countries, in the study performed in 1996. The change arising from real wages in the countries having a strong labor was revealed that it caused to the changes in the productivity and inflation as a result of the regression analysis performed (Volgy, Schwarz & Imwalle, 1996, pp.1233-1252).

Dritsakis researched a relationship between the labor productivity, real wage and unemployment for the period 1960:1-2000:4 by discussing data of Greece, in a study performed in 2004. A quite important causality was revealed by the labor productivity and real wages in the study, in which the VAR model and Granger causality analysis were performed. On the other hand, a strong causality relationship was found by the labor productivity, real wages and unemployment rate; as it was between the real wages and the unemployment rate (Dritsakis, 2004).

Narayan and Smyth investigated an effect of the inflation and real wages on the productivity based on the period 1960-2004 of D7 countries, in the study performed in 2009. An increase in the real wages caused to the productivity, however, not any significant relationship arose between the productivity and inflation as a result of the study, in which the panel data and cointegration analysis were performed (Narayan & Smyth, 2009, pp.1285-1291).

Taymaz, Voyvoda and Yılmaz researched a relationship between the real wages and productivity by discussing data for the period 1983-1996, in the study performed in 2009. A unidirectional causality was revealed from the real wages to the productivity in said period as a result of the study (Taymaz, Voyvoda & Yılmaz, 2009).

Klein researched a relationship between the real wages and labor productivity based on the period 1994:1-2011:1 in South Africa and revealed a significant and positive relationship between the real wages and labor productivity, in the study performed in 2012 (Klein, 2012).

Tang analyzed an effect of the real wages and inflation on the labor productivity by discussing data of Malaysia economy for the period 1970-2007, in the study performed in 2014. A two-way causality between the real wages and inflation and a unidirectional causality between the real wages and labor productivity were revealed as a result of the study. In other words, a unidirectional causality was determined from the real wages to the productivity (Tang, 2015, pp.311-322).

Tsoku and Matarise investigated a relationship between the real wages and labor productivity by discussing data of South Africa for the period 1970-2011, in the study performed in 2014.
Not any causality relationship was revealed by the real wages and labor productivity in the study, in which the cointegration and causality analysis were performed (Tsoku & Matarise, 2014).

Islam, Kinyondo and Nganga researched a relationship between the real wages and productivity by discussing data of Tanzania economy for the period 1967-2010, in the study performed in 2015. Not any relationship was found between the real wages and productivity as a result of the study (Islam, Kinyondo & Nganga, 2015, pp.81-98).

Tamasauskiene and Stankaityte investigated a relationship between the wages and labor productivity as part of the regions and economic sectors, based on Lithuania economy for the period 2005-2010, in the study performed in 2013. The prices’ differences were revealed higher than the labor productivity in said period as a result of the study (Tamasauskiene and Stankaityte, 2013, pp.24-35).

Nayak and Patra analyzed a relationship between the wage and labor productivity by using a time-series data based on the manufacturing industry of Odisha for the period 1998-2009, in the study performed in 2013. A positive correlation was determined by these two variables as a result of the study. On the other hand, while the net value added per laborer and wages per laborer were increasing, the relationship to each other was in the positive direction. However, the growth rate for net value added per laborer was higher than the growth rate for wages per laborer (Nayak & Patra, 2013, pp.8-11).

Yıldırım analyzed a relationship between the labor productivity, real wages and inflation by using the data of Turkish manufacturing industry for the period 1988:1-2012:1, in the study performed in 2015. The inflation’s effect on the labor productivity arose greater than the real wages as a result of the study, in which the ARDL model and Granger causality test were used. On the other hand, while the mutual interaction was discussed between the labor productivity and inflation, a unidirectional causality was seen from the real wages to the productivity (Yıldırım, 2015, pp.85-103).

Goh and Wong researched a relationship between the productivity, real wage and unemployment by using the annual data of Malaysia for the period 1970-2005, in the study performed in 2010. A long-run relationship was emphasized on the real wages and productivity in said period as a result of the study, in which the Johansen cointegration test and error model were used. In the study, it was also revealed that the unemployment had an unimportant effect on the real wage rate and labor productivity’s importance was a long-run factor of the real wages. In other words, the real wages were expressed to be more sensitive to the change to be arisen in the labor productivity (Goh & Wong, 2010).
4. METHOD

In this study, a long-run relationship and this relationship’s causality were analyzed between the productivity and real wage. While the Bound Testing Approach was using to reveal a long-run relationship between the variables, the Granger Causality test was used in investing the causality relationship. The ARDL test, also known as the Bound Testing Approach, stated to be more useful when compared with the cointegration test developed by Engle-Granger (1987), Johansen (1988), and Johansen-Juselius (1990). The series to be included in the analysis in said tests should contain the unit root level and be integrated when subtracted. In this context, if one of some part of the series is stable, the cointegration relationship may not be researched. There is not such a restriction on the ARDL test developed and revealed by Pesaran et al. (2001). In other words, even if the series’ stability levels are different, it may be tested whether there is a cointegration relationship. On the other hand, the Bound Testing Approach (ARDL test) works better in the data having a small number of observations (Narayan & Narayan, 2004; Pesaran et al., 2001). In conclusion, the ARDL cointegration test was used to reveal whether there is a cointegration relationship between the series and a long-run relationship to the variables discussed in our study.

4.1.1. ARDL TEST (BOUND TESTING APPROACH)

A long-run relationship’s existence is performed with the cointegration test in order to determine the causality relationships between the variables to be reviewed. The cointegration test may be made with the methods developed by Engle-Granger (1987), Johansen (1988), Johansen-Juselius (1990), and Pesaran et al. (2001). In this study, the ARDL model developed by Pesaran et al. (2001) is used due to the advantages it has.

The AIC or SC criteria are used to select the lag length, as it is in the unit root tests. On the other hand, the autocorrelation problem should not happen to the error terms in terms of being given the healthy results from this test. The lag length model providing the smallest AIC value is accepted herein as the lag length. However, if there is an autocorrelation problem with the model selected according to the smallest AIC value; in this case, the lag length of model giving the second the smallest AIC value is selected. Said period continues, until the autocorrelation problem is disappeared. After determining the appropriate lag length, a long-run relationship’s existence is tested by the F-test (Wald Test) between the variables, if determined lag length does not contain an autocorrelation. Pesaran et al. (2001) or Narayan (2005) test statistics may be discussed in the test statistic. Although Pesaran et al. (2001) developed the ARDL method, Narayan (2005) developed the test statistic based on the number of observations for smaller observations.
4.1.2. GRANGER CAUSALITY TEST

The Granger causality test developed by Granger (1969, 1988) is most frequently used test in determining the causality relationship between the variables in the applied econometric studies. If there is not any causality relationship between the variables, the regression analysis's results does not express a meaning in terms of the economic aspect, even if it is statistically significant. Equation 2 and Equation 3 are used to determine the variables’ causality relationship.

\[ X_t = \sum_{j=1}^{p} A_{11,j} X_{t-j} + \sum_{j=1}^{p} A_{12,j} Y_{t-j} + e_{1,t} \]  
\[ Y_t = \sum_{j=1}^{p} A_{21,j} Y_{t-j} + \sum_{j=1}^{p} A_{22,j} X_{t-j} + e_{2,t} \]

The Granger causality test should be performed by testing whether delayed values’ coefficients for \( Y \), which is an independent variable in Equation 2, equal to zero in groups (all \( A_{12} \)). The test used herein is the F test (Wald test). If the coefficients of \( A_{12} \) are found different than zero in a certain significance level in Equation 2, \( Y \) is considered as the reason of \( X \). In other words, if the variance of \( e_1 \) decreases by adding \( Y \) term, \( Y \) may be said as the Granger reason of \( X \) in Equation 2. Similarly, if the coefficients of all \( A_{22} \) are found different than zero in a certain significance level, \( X \) is considered as the reason of \( Y \) in Equation 3. In other words, if the variance of \( e_2 \) decreases by adding \( X \), \( X \) is said as the Granger reason of \( Y \) in Equation 3. If the coefficients of both \( A_{12} \) and \( A_{22} \) are synchronously significant in the analysis results related to Equation 2 and Equation 3, there is a mutual causality relationship between \( Y \) and \( X \). However, if the coefficients of \( A_{12} \) are different than zero, there is a unidirectional causality from \( Y \) to \( X \), in Equation 2 and if the coefficients of \( A_{22} \) are different than zero, there is a unidirectional causality from \( X \) to \( Y \) in Equation 3. In the case where the coefficients of both \( A_{12} \) and \( A_{22} \) are not different than zero, there is not any causality relationship between \( X \) and \( Y \).

5. DATA AND EMPIRICAL RESULTS

In this study; the cointegration relationship and causality relationship tried to be revealed between the productivity and real wage in terms of the total industry of Turkish economy. The original data used in the study is a quarterly data of the period 2007:1-2017:3. The data belonging to variables of the productivity and real wage consists of the labor productivity index per hour and real wage index per hour, based on 2010:100 in the total industry, respectively. Said data is received from the electronic data distribution system of Ministry of Development.

As the seasonality’s effect was accepted as important in said series, the series were seasonally corrected. Then, the analysis was entered after taking the natural logarithm of labor productivity (PR) and real wage (RW) series in the model.
5.1. UNIT ROOT TEST RESULTS

The ADF (Augmented Dickey Fuller) (1981), DF (Dickey-Fuller) (1979), and PP (Phillips Perron) (1988) unit root tests were applied, in order to test whether the lnPR and lnRW time-series are stabiles discussed in the study. The unit root tests’ results are shown in Table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level/ First Difference</th>
<th>ADF Statistic</th>
<th>DF Statistic</th>
<th>PP Statistic</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Constant/Trend</td>
<td>Constant/Trend</td>
<td>Constant/Trend</td>
<td></td>
</tr>
<tr>
<td>lnPR</td>
<td>Level</td>
<td>-0.005(0)</td>
<td>0.676(0)</td>
<td>0.406(6)</td>
<td>I (1)</td>
</tr>
<tr>
<td></td>
<td>First Difference</td>
<td>5.936(0)***</td>
<td>6.006(0)***</td>
<td>-5.956(7)***</td>
<td></td>
</tr>
<tr>
<td>lnRW</td>
<td>Level</td>
<td>-2.274(0)</td>
<td>-2.237(0)</td>
<td>-2.237(4)</td>
<td>I (1)</td>
</tr>
<tr>
<td></td>
<td>First Difference</td>
<td>6.605(0)***</td>
<td>6.631(0)***</td>
<td>-8.298(18)***</td>
<td></td>
</tr>
</tbody>
</table>

(1) The values in brackets are the lag lengths selected by using the SIC and maximum lag length was taken as 9. The optimal lag length in the PP test was found by benefiting from Bartlett Kernel (default) Spectral Estimation Method and Newey-West Bandwidth (automatic selection) criteria.

(2) The ***, **, and * signs express the significance at the level of 1%, 5% and 10% respectively and state that the variables are stable at the level of 1%, 5% and 10% respectively.

The unit root test results are shown in Table 1 for the series belonging to lnPR and lnRW variables. When it is looked at Table, it is seen that the lnPR and lnRW variables are not stable in their levels, but they become stable when the first differences are subtracted, according to the ADF (Augmented Dickey Fuller), DF (Dickey-Fuller) and PP (Phillips Perron) unit root test results. In this context, the integration degree of lnPR and lnRW series is I (1).

5.2. BOUND TESTING APPROACH

The lnPR and lnRW variables were determined as stable when their first differences were subtracted as a result of the ADF, DF and PP unit root tests applied. The ARDL (Bound Test Approach) test is entered, after revealing the cointegration degree of lnPR and lnRW series is I (1), as a result of the unit root tests. In this context, it is found that the dependent variable is lnPR and the independent variable is lnRW in our study. The econometric model established
for two-variable ARDL Test is as follows. In other words, a long-run relationship’s existence was shown in Equation 1 among the variables of ARDL model.

\[
\Delta \ln PR_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta \ln PR_{t-i} + \sum_{i=0}^{p} \beta_{2i} \Delta \ln RW_{t-i} + \lambda_1 \ln PR_{t-1} + \lambda_2 \ln RW_{t-1} + \varepsilon_t
\]  

(1)

While \( \varepsilon_t \) is showing the error term, \( \Delta \) shows the first difference operator in Equation 1. The \( \ln PR \) and \( \ln RW \) variables represent the productivity and real wages, respectively.

The optimum lag length, expressed as \( p \) in Equation 1, should be determined to be applied to the Bound Testing Approach (ARDL Test). The maximum lag length was assigned as 8 due to the investigated data set was a quarter-period and the optimum lag length was found as 8 according to the AIC criteria by using Equation 1 above. On the other hand, not any autocorrelation was encountered in the model’s error term. The cointegration relationship was entered by the variables, after determining the optimum lag length. The zero (\( H_0 = \lambda_1 = \lambda_2 = 0 \)) hypothesis should be tested by the cointegration relationship between the variables in the Bound Testing Approach approach. The F-test (Wald Test) reveals the \( H_0 \) hypothesis’ acceptance or rejection. The F statistic, obtained as a result of the F test, is seen to be greater at 5% level rather than Table’s upper critical value in Pesaran et al. (2001). The result obtained gives us that the \( H_0 \) hypothesis is rejected, and this condition shows a cointegration relationship between the variables. A long-run cointegration relationship’s test results are given in Table 2 (Eviews 7.0 econometric program was used in model estimation).

The optimum lag length was found as 8 by using the AIC criteria, as it is seen in Table 2.

<table>
<thead>
<tr>
<th>Model</th>
<th>k</th>
<th>F-Statistic</th>
<th>Lag Length</th>
<th>Existence of Cointegration Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F_{PR} ) (( \ln PR \mid \ln RW ))</td>
<td>1</td>
<td>5.75</td>
<td>8</td>
<td>YES</td>
</tr>
</tbody>
</table>

Diagnostic Test Results

- R-squared = 0.855
- Adjusted R-squared = 0.659
- Durbin-Watson stat = 1.893

(1) The maximum lag length was taken as 8 and AIC criterion was discussed together in determining the optimal lag length.

(2) There is not any series correlation of the error term up to 8 delays according to Breusch-Godfrey Series and Correlation LM Test statistic.
(3) The lower and upper critical limit values at the 5% significance level were 4.94 and 5.73 respectively, and Pesaran (2001) was taken as the table case (III).

5.3. GRANGER CAUSALITY TEST

Performing the Granger causality test is significant, after revealing a long-run relationship between the variables as a result of the cointegration test for productivity and real wages. However, if there was not a long-run relationship between the variables as a result of cointegration test, the Granger causality test was performed and causality relationship was revealed, as a result of the Granger causality test. This condition does not express a meaning in terms of the economic aspect. A unidirectional and/or two-way causality relationship should be found by the variables as a result of the causality test to be performed after the cointegration relationship is found by the variables. The Granger Causality Test’s \( H_0 \) hypotheses are shown in Table 3.

<table>
<thead>
<tr>
<th>Null Hypothesis ( (H_0) )</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>( H_0: \ln RW ) does not Granger Cause ( \ln PR )</td>
<td>( H_0 = ) ACCEPT ( H_0 = ) REJECTION</td>
</tr>
<tr>
<td>( H_0: \ln PR ) does not Granger Cause ( \ln RW )</td>
<td>( H_0 = ) ACCEPT ( H_0 = ) REJECTION</td>
</tr>
</tbody>
</table>

The Granger causality test results are given in Table 4 between the productivity and real wages.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Lag Length</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \ln RW ) ( \rightarrow ) ( \ln PR )</td>
<td>1 2 3 4 5 6 7 8</td>
<td>ACCEPT</td>
</tr>
<tr>
<td>( \ln PR ) ( \rightarrow ) ( \ln RW )</td>
<td>- - - - - - - -</td>
<td>REJECTION</td>
</tr>
</tbody>
</table>

(1) The ***, ** and * signs show 1%, 5% and 10% significance levels respectively.

The unidirectional, strong and short-run causality relationship was determined by the real wages (\( \ln RW \)) for the productivity (\( \ln PR \)) (we say strong if it is 1% and 5%). It is also seen in Table 4 according to the Granger Causality Test results. While the real wages were productivity’s reason for the first six months, the real wages were not productivity’s reason for the second six months. This result shows us that a change occurring in the real wages in short-run causes to the changes in productivity. However, it is not possible to say something certain in terms of a
PRODUCTIVITY AND REAL WAGE RELATIONSHIP IN TURKEY: COINTEGRATION AND CAUSALITY ANALYSIS

Sevilay SARICA

long-run period. Moreover, the causality test results reveal that there is not any causality from the productivity (lnPR) to the real wages (lnRW). In other words, a change in the productivity does not cause a change in the real wages.

Table 4. Results of Granger Causality Tests

<table>
<thead>
<tr>
<th>Null Hypothesis(H0)</th>
<th>Lag Length</th>
<th>Number of observations</th>
<th>F-Statistic</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H0: lnRW does not Granger Cause lnPR lnRW → lnPR</td>
<td>1</td>
<td>42</td>
<td>7.07787 (0.0113)</td>
<td>Relationship THERE IS</td>
</tr>
<tr>
<td>H0: lnPR does not Granger Cause lnRW lnPR → lnRW</td>
<td>1</td>
<td>42</td>
<td>1.59086 (0.2147)</td>
<td>Relationship NO</td>
</tr>
</tbody>
</table>

A unidirectional and strong causality relationship was determined by the productivity for the real wages according to the Granger causality test result, as it is seen in the Table (we say strong if it is 1% and 5%). This result expresses us that a change in the real wages causes to the changes in the productivity, but a change in the productivity does not cause a change in the real wages.

<table>
<thead>
<tr>
<th>Null Hypothesis(H0)</th>
<th>Lag Length</th>
<th>Number of observations</th>
<th>F-Statistic</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H0: lnRW does not Granger Cause lnPR lnRW → lnPR</td>
<td>2</td>
<td>41</td>
<td>3.86186 (0.0302)</td>
<td>Relationship THERE IS</td>
</tr>
<tr>
<td>H0: lnPR does not Granger Cause lnRW lnPR → lnRW</td>
<td>2</td>
<td>41</td>
<td>1.39084 (0.2619)</td>
<td>Relationship NO</td>
</tr>
</tbody>
</table>

A unidirectional and strong causality relationship was determined by the real wages for the productivity according to the Granger causality test result, as it is understood in the Table (we say strong if it is 1% and 5%). This result expresses us that a change in the real wages causes the changes in the productivity, but does not cause a change in the real wages.

<table>
<thead>
<tr>
<th>Null Hypothesis(H0)</th>
<th>Lag Length</th>
<th>Number of observations</th>
<th>F-Statistic</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H0: lnRW does not Granger Cause lnPR lnRW → lnPR</td>
<td>3</td>
<td>40</td>
<td>2.70788 (0.0610)</td>
<td>Relationship NO</td>
</tr>
<tr>
<td>H0: lnPR does not Granger Cause lnRW lnPR → lnRW</td>
<td>3</td>
<td>40</td>
<td>0.96668 (0.4201)</td>
<td>Relationship NO</td>
</tr>
</tbody>
</table>
Not any causality relationship could be determined by both the real wages and productivity from the productivity to the real wages, according to the Granger causality test result, as it is seen in the Table.

<table>
<thead>
<tr>
<th>Null Hypothesis(H0)</th>
<th>Lag Length</th>
<th>Number of observations</th>
<th>F-Statistic</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H0: lnRW does not Granger Cause lnPR lnRW → lnPR</td>
<td>4</td>
<td>39</td>
<td>2.21512 (0.0911)</td>
<td>Relationship NO</td>
</tr>
<tr>
<td>H0: lnPR does not Granger Cause lnRW LnPR → lnRW</td>
<td>4</td>
<td>39</td>
<td>1.35483 (0.2729)</td>
<td>Relationship NO</td>
</tr>
</tbody>
</table>

Not any causality relationship could be determined by both the real wages and productivity from the productivity to the real wages, according to the Granger causality test result, as it is seen in the Table.

6. RESULT

In the study, first of all, the relationship’s theory was given by the productivity and real wages. There are theories revealing that there is a close relationship between the productivity and real wages in the macroeconomic theory. One of these theories is the Efficient Wage Theory. The Efficient Wage Theory is constitutively based on an assumption that the labor’s productivity depends on the real wages. The firms herein desire to increase the laborers’ productivity by increasing the laborers’ working requests and efforts, by means of increasing the real wage level paid to the laborers in order to increase their profitability. However, the real wage increases begin decreasing the laborers’ productivity for a while instead of increasing, when the law of diminishing returns shows-up. In this case, the firms targeting the profit maximization make a payment equal to the optimum wage level and marginal efficiencies, and this wage level is therefore called as the efficient wage level. The Efficient Wage Theory reveals that an increase in the real wages causes to an increase in the productivity. The firms accept to make a payment to the laborers more than the equilibrium wages in order to increase their productivity in the production. On the other hand, the firms make a payment more than the market equilibrium wage. In this way, they provide the laborers to work more due to their fears to lose a good job and increase their profitability or prevent the laborers to go to the firms giving higher wage, according to the Efficient Wage Theory.

In conclusion, the efficient wage paid causes the productivity to increase by leading the laborers to work with a higher performance. In this context, a positive causality is discussed by the wages to the productivity.

Another one of the theories discussing the relationship between the productivity and real wages is the Wage Bargaining Theory. When the unions make a wage bargaining, they consider the performance according to the Wage Bargaining Theory. The productivity’s increase reveals the
wages to increase, depending on the performance in this theory. In other words, the causality is discussed in a positive direction from the productivity to the wages. The wage bargaining theory emphasizes that the wage is determined according to the mutual bargaining power of laborers and employers. Therefore, while organization of the laborers in their unions is increasing their bargaining powers, their subversion decreases their bargaining powers. In this context, the laborer unions’ bargaining power in the wage stage has a great importance in terms of being provided a balance in face of the employer. Because, when this condition is discussed, the laborer’ wages increase within the labor’s productivity criterion.

The unions’ bargaining power is high in the periods, in which the unemployment rates are low. This condition causes the real wages to increase, by leading the unions’ wage increase requests and the acceptance possibilities of them. However, the real wages are expected to decrease, as the unions’ bargaining power decrease in the periods, in which the unemployment rates are high. If the productivity increases, the wage level increases; and if the productivity does not increase, the wage level does not increase. In other words, there is a positive causality herein from the productivity to the wages. Increasing the employee’s productivity decreases the wages, by leading the supply to increase. A decrease in the prices increases the employee’s income and wage.

In the second part of the study, a long-run relationship’s existence was analyzed by the productivity and real wages and causality relationship between the variables in Turkish Industry, by using a quarterly data belonging to the Turkish industry for the period 2007:1–2017:3. The stability structure of variables was firstly investigated by the productivity and real wage as part of the analysis. Then, the cointegration relationship was revealed by the variables by performing the ARDL test (Bound Testing Approach). The long-run relationship was determined as a result of the Bound Testing Approach between the productivity and real wages. The Granger causality test was performed, after determining the long-run relationship’s existence between the variables. In other words, the causality relationship and causality’s direction were tried to be revealed by the variables. While the Granger causality test reveals a unidirectional and strong causality relationship from the real wages to the productivity in terms of a short-run period, it showed that saying something certainly could not be possible in terms of a long-run period. This result reveals in the real wages that a change causes to the productivity’s changes and an increase causes to the productivity’s increase. When it is looked at the relationship’s direction, the result reached was seen that it supported the Efficient Wage Theory.
References


Heijdra, B. J., & Ploeg, F. van der. (2002). The Foundations of Modern Macroeconomics. Published by Oxford University Press, USA.


PRODUCTIVITY AND REAL WAGE RELATIONSHIP IN TURKEY: COINTEGRATION AND CAUSALITY ANALYSIS

Sevilay SARICA


Introduction

Economic growth and population are the important subjects in economics and the population change has an important effect on the economic growth. The current world population is 7.53 billion in 2017 and it has an increasing trend from 1960 to 2017 (World Bank, 2018). In addition, MENA countries have an increasing population trend while they have a decreasing population growth rate.

The Middle East had the highest fertility in the world in 1950s (Yousef, 2004). The population growth reached the highest level in 1985 than started to fall in the 1990s (Courbage, 1999). Nowadays, MENA countries have higher fertility levels. The possible reasons behind this are female education and improved health conditions (Al-Qudsi, 1998). Singerman & Ibrahim (2001) emphasizes the importance of other factors such as rising unemployment, high marriage cost and housing shortages on the fertility rate (as cited in Yousef, 2004). Many governments aim to reduce the fertility rate, such as Iran does. Iran’s comprehensive family planning program provides the declining in fertility rates in the twentieth century (Yousef, 2004).

The fertility reduction is an important aim of the economic development. Therefore, there are many theoretical and empirical analysis of the relationship between fertility rate and economic growth in the literature. This study investigates the relationship between fertility rate and economic growth in MENA countries. The first part of this study comprised of a review of the literature related to the fertility rate and economic growth. Then the relationship is investigated for selected MENA countries using the panel data analysis which consists of the data for 13 countries from 1990 to 2016. These data sets are collected from the World Bank Database. In conclusion, this relationship in MENA countries is explained according to the results of the models.
The Literature Review of The Economic Growth and Fertility

Many economists, especially Thomas Malthus, emphasized the relationship between the economic growth and fertility if we look at the historical relationship between economic growth and population. Before 1800, the average of economic growth was very low and then after 1800 reached to extremely higher rates. There are three theory of the relationship between economic growth and population which have been debated by economists and demographers. These are pessimistic theory, optimistic theory, and neutralist theory (Bloom, Canning and Sevilla, 2001).

The Malthusian model has two important statements. The first statement is a negative relationship between income levels and the size of population whereas the second statement is and a positive relationship between income levels and population growth (Whelan, 2015). Therefore, the Malthusian model is defined as a pessimistic theory. This model reaches to the steady state at where there is no population growth. However, this model does not apply today because Malthus did not predict the effects of technological advances on fertility. The Malthusian model predicts that standards of living will remain constant over time, even in the face of technological progress (Weil, 2013).

The thoughts of Malthus regarding the relationship between fertility and income, were developed by Becker (1960) and Becker and Lewis (1973). Becker (1960) emphasizes the negative relationship between the fertility and income in their studies. In addition to Becker (1960), Barro and Becker (1989) and Fernandez-Villaverde (2001) have analyzed the relationship between fertility rate and economic growth. On the other hand, many studies have found a positive relationship between the growth and fertility which is known as an optimistic theory. When the population size increase, it affects the economic stability in a positive way by increasing human talent and knowledge (Simon, 1989; Bloom et al. 2001). Another aspect is a neutralist theory. It explains that population growth does not have a positive or a negative effect on the growth.

The relationship between economic growth and population has been studied by many researchers such as Becker (1960), Galor and Weil (1993), Barlow (1994), Kelley and Schmidt (1996), Al-Qudsi (1998) Telatar and Terzi (2010), Brander and Dowrick (1994), Ukpolo (2002), Akın and Aytun (2016). They have used different estimation methods and different variables such as education, fertility rate, mortality rate, labour participant.

Becker (1960) is one of the pioneers in the analysis of fertility. The results of the Becker (1960) indicate that fertility is determined by income, knowledge, child costs and uncertainty. Many studies have separated population growth into its fertility and examined their independent effects on economic growth such as Barlow (1994), Brander and Dowrick (1994), Coale (1986), Kelly and Schmit (1995).

Brander and Dowrick (1994) examine the effects of fertility on the economic growth using panel data that include 107 countries and span from 1960 to 1985. According to results, high birth
rates may reduce economic growth through investment effects. On the other hand, the decrease in the birth rate may have a strong positive impact on the economic growth in medium-term.

Galor and Weil (1993) explain the linking mechanism of fertility and growth with labor supply. According to them, the relative wages of men and women determine the households fertility. When women’s wages increase, it will cause the fertility reduction because of the cost of children will exceed household income. Barlow (1994) examines the relationship between the population rate and economic growth by using the correlation analysis. According to Barlow (1994), due to the correlation of the current fertility and the past fertility, current population growth rates show both the short-run negative and the long-run positive effects. In relation to that, in the short-run, an increase in fertility trends may have negative effects on per capita income growth.

Al-Qudsi (1998) analysis of the empirical evidence on fertility determinants in Arab countries using the panel and count data models. This study estimates the impact of economic and cultural factors on the demand for children in Arab countries. According to Al-Qudsi (1998), female education reduces the high fertility and parent’s preferences for sons and child mortality positively affect fertility. Also, wages of working women has negatively impact on fertility. Moreover, Selim and Üçdoğan (2003) investigate the determinants of the number of the children. They find the negative relationship between the wage of women and the number of the children whereas there exists the positive relationship between the income of the household and the number of the children.

Li and Zhang (2007), analyze the effect of the birth rate on economic growth in provinces of China and they find the birth rate has a negative effect on economic growth. Ukpolo (2002) examines the causality between population growth and economic growth in Africa, using Johansen and Granger-causality models. A negative long-run causal relationship between the two variables is found for Nigeria. Telatar and Terzi (2010) examine the relationship between population, education and economic growth for Turkey. In this study, the relationship between population, education and the economic growth are analyzed by means of Granger causality test and VAR analysis period 1968-2006. The results of this study indicate that an increase in GDP per capita may lead to a decrease in population growth rate. Ali, Alam, Islam and Hossain (2015) examines empirically the relationship between population growth and economic development in Bangladesh. The results show a negative and significant relationship between population growth and economic development.

Deliktaş, Usta, Bozkurt and Helvacı (2008), examine the effects of education level, urbanization level, income per capita, and industrialization level of cities on the fertility rate using the Path analysis for 81 Turkey cities. The results indicate that urbanization level, education level, industrialization level of cities and income per capita have significant effects on fertility rates of the cities. According to results, the education level, industrialization level, the urbanization
level and income per capita are negatively related to the fertility rates. Akın and Aytun (2016) investigates the causality relationship between the fertility rate, per capita income, women’s primary school enrollment and dependency ratio for Turkey. According to the results, they find the strong causality relationship between the fertility rate and income per capita, the dependency ratio and primary school enrollment in the long-term.

Methodology

Data

According to the previous studies, the demographic factors such as population size, fertility rate, life expectancy at birth, education level of the individuals and labour participant rate of women have a very significant influence on the economic growth. Therefore, this study examine the relationship between growth, fertility, education and labour participant of women with using panel data analysis. The data set is a panel of 13 MENA countries1 over the period 1990-2016. These data set are collected from the World Bank Database (2018). The study uses the panel data estimation techniques which are pooled OLS regression model, fixed effect model and random effect model.

The econometric model can be written as follows;

\[ \ln \text{GDP} = f(\ln \text{TFR}, \ln \text{FLFP}, \ln \text{SE}) \]  

(1)

The dependent variable is the gross domestic product per capita (GDP-measured in current US$) and independent variables are total fertility rate (TFR- births per woman), female labor force participation rate (FLFP-% of female population ages 15+) and primary school enrollment ratio (SE-(% gross) in the model. All variables are taken in logarithm in the model. The GDP per capita is used as a proxy for economic growth in this study which examines the impact of fertility rate on the economic growth in MENA countries.

As it can be seen from Table 1, the average GDP per capita rate in 13 MENA countries is 8.639 for the period of 1990-2016. Also, the average of total fertility rate is 1.026, the average female labor force participation rate is 3.329 and the average of primary school enrollment is 4.551 for the same period.

---

1 Algeria, Djibouti, Bahrain, Egypt, Arab Rep., Israel, Iran, Islamic Rep., Kuwait, Morocco, Lebanon, Oman, Turkey, Qatar, Tunisia.
Table 1: Descriptive of data set for MENA countries

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lngdp</td>
<td>351</td>
<td>8.638368</td>
<td>1.226663</td>
<td>6.444545</td>
<td>11.39149</td>
</tr>
<tr>
<td>Lntr</td>
<td>351</td>
<td>1.025852</td>
<td>.2830691</td>
<td>.4687529</td>
<td>1.969208</td>
</tr>
<tr>
<td>Lnflfp</td>
<td>351</td>
<td>3.329955</td>
<td>.4558751</td>
<td>2.285235</td>
<td>4.083823</td>
</tr>
<tr>
<td>Lnse</td>
<td>351</td>
<td>4.551721</td>
<td>.2650282</td>
<td>3.43245</td>
<td>4.898935</td>
</tr>
</tbody>
</table>

Source: World Bank databases

Method and Model

Panel data analysis has a rising trend as a research tool for econometric studies because it allows modelling time dimension and cross-section dimension together. The fundamental advantage of a panel data set over a cross-section is that it will allow the researcher great flexibility in modelling differences in behaviour across individuals (Greene; 2012). There are three approaches to estimate the panel data model; the pooled OLS regression model, the fixed effect model and the random effects model.

The basic panel date regression model is as follows (Baltagi, 2005):

$$y_{it} = \alpha + X_{it}'\beta + u_{it} \quad i = 1, 2, ..., N \quad t = 1, 2, ..., T$$  \hspace{1cm} (2)

i denotes the cross-section dimension like households, individuals, firms, countries, etc. and t denotes the time dimension. $\alpha$ is a scalar and $\beta$ is $K \times 1$ and $X_{it}$ is the itth observation on K explanatory variables.

The error component is as follows (Baltagi, 2005):

$$u_{it} = \mu_i + v_{it}$$  \hspace{1cm} (3)

$\mu_i$ is the unobservable individual-specific effect and $v_{it}$ is the remainder disturbance.

In this study, firstly the cross-section dependence test is estimated, then the stationarity properties of individual series in the panel data sets are examined using a panel unit root tests. After these estimations, the pooled OLS regression model is estimated. Then the fixed effect model (FE) and the random effect model (RE) are estimated for MENA countries. The appropriate model for this analysis is chosen by using the Hausman test which compares the results of the FE model and RE model.
Empirical Results

Cross-section Dependence (CD) test

Panel data analysis includes both cross-sectional units and a time series dimension. One can assume that cross-sections can affect one another over a given time period. For instance, if a shock occurs in one of the countries in the panel dataset, it can affect other countries. This problem is known as “cross-section dependence” in the panel dataset.

In this context, to investigate the cross-section dependence in panel data The Breusch-Pagan (1980) test is used. The Breusch-Pagan (1980) Lagrange Multiplier (LM) test will be estimated when the time dimension (T) of the panel is larger than the cross-sectional dimension (N) (Ün, 2015). This test examines whether there is a relationship between the error terms or not. The Breusch-Pagan LM test is calculated as follows:

\[ \lambda_{LM} = T \sum_{i=1}^{N} \sum_{j=i+1}^{N} \hat{\rho}_{ij}^2 \]  

(4)

\( \hat{\rho}_{ij} \) is the correlation coefficient between the error terms of the i and j units (Yerdelen Tatoğlu, 2013).

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistics</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM test</td>
<td>552.702</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Table 2. The Lagrange Multiplier (LM) test

Source: Author’s own calculations

The null hypothesis is “there is not cross-section dependency” and the alternative hypothesis is “there is cross-section dependency” in The Breusch-Pagan (1980) Lagrange Multiplier (LM) test. According to LM test results in Table 2, the null hypothesis rejected and there is cross-section dependency. In the presence of cross-section dependence, “the second generation” panel unit root tests should be used. Therefore the CADF test (Pesaran, 2007) and CIPS test are applied and estimated for the unit root analysis.

Unit Root Tests

CADF test (Pesaran, 2007) is the t-test for unit roots in heterogeneous panels with cross-section dependence. The null hypothesis presumes that all series are non-stationary.

The unit root tests can be used for each cross-section in the panel data with CADF. The CADF regression is as follows (Pesaran, 2007);
\[ \Delta y_{it} = \alpha_i + b_i y_{i,t-1} + c_i \bar{y}_{t-1} + d_i \Delta \bar{y}_t + e_{it} \quad (5) \]

\( \bar{y}_t \) is the average of the cross sections in time \( t \).

The CIPS (Cross-Sectionally Augmented IPS) is as follows;

\[ CIPS = N^{-1} \sum_{i=1}^{N} t_i(N,T) \quad (6) \]

where \( t_i(N,T) \) is the cross-sectionally augmented Dickey-Fuller statistic for the \( i^{th} \) cross-section unit.

### Table 3: Unit Root Test Results

<table>
<thead>
<tr>
<th></th>
<th>CADF</th>
<th>CIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lngdp</td>
<td>0.000</td>
<td>-2.822</td>
</tr>
<tr>
<td>Lntfr</td>
<td>0.000</td>
<td>-2.610</td>
</tr>
<tr>
<td>Lnse</td>
<td>0.001</td>
<td>-2.147</td>
</tr>
<tr>
<td>Lnflfp</td>
<td>0.407</td>
<td>-1.128</td>
</tr>
</tbody>
</table>

Source: Author’s own calculations

The results show that for lnGDP, lnTFR and lnSE, the second generation unit root test rejects the unit root hypothesis and CADF test is significant. But the CADF test is not significant for LnFLFP. It means that variable LnFLFP has the unit root at the level, the first difference of this variable is taken. After taking the first difference, the variable LnFLFP becomes stationary.

The CIPS statistical value is not asymptotic and the critical values are given by Pesaran (2007). According to table 3, variables do not have unit root at the level except the variable LnFLFP. After taking the first difference, the variable LnFLFP becomes stationary. CIPS statistics of LnFLFP is bigger than critical values so that this variable is nonstationary in level. On the other hand, when the first difference of variable is taken, their CIPS statistics will be smaller than critical values. Hence, the first differences of the variable are stationary.

### Diagnostic Tests

The Hausman test and Breush Pagan LM Test are used to decide which panel estimation techniques are appropriate for this model. The Hausman test is used to determine whether fixed effect model or random effect model is appropriate. On the other hand, Breush Pagan LM Test is used to determine whether random affect model or pooled OLS regression model is appropriate. According to the Hausman test, the null hypothesis is “random model is appropriate” and the alternative hypothesis is “fixed effect model is appropriate”. Because the probability of
the Hausman test is more than 0.05 (0.7686>0.05), the null hypothesis is not rejected. Hence, the results of the Hausman test indicate that the random effect model is appropriate for this analysis. For Breush Pagan LM Test, the null hypothesis is “Pooled OLS regression model is appropriate” and the alternative hypothesis is “random effect model is appropriate”. Because the probability of the test is smaller than 0.05 (0.000<0.05), the alternative hypothesis is accepted. Thus, according to the results of Breush Pagan LM Test, the random effect model is appropriate for this analysis.

### Table 4: Hausman Test and Breush Pagan LM Test

<table>
<thead>
<tr>
<th>Prob</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hausman Test</td>
<td>0.7686</td>
</tr>
<tr>
<td>Breush Pagan Lm test</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Source: Author’s own calculations

### Estimation Results

The estimation results of the pooled OLS regression model, the fixed effect model, and the random effect model are summarized in Table 5.

### Table 5: Estimation Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>The Estimation</th>
<th>Pooled OLS Model</th>
<th>Fixed Effect Model</th>
<th>Random Effect Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>LnTFR</td>
<td>$\beta_1$</td>
<td>-0.8402827 (0.002)</td>
<td>-1.619074 (0.000)</td>
<td>-1.614546 (0.000)</td>
</tr>
<tr>
<td>LnSE</td>
<td>$\beta_2$</td>
<td>1.396906 (0.000)</td>
<td>0.5041676 (0.003)</td>
<td>0.5150927 (0.002)</td>
</tr>
<tr>
<td>DlnFLFP</td>
<td>$\beta_3$</td>
<td>2.985769 (0.145)</td>
<td>-0.6211923 (0.339)</td>
<td>-0.6055123 (0.350)</td>
</tr>
</tbody>
</table>

Source: Author’s own calculations

As it can be seen from Table 5, the estimated coefficients of the total fertility rate at the 5% level indicate that total fertility rate has a significant negative effect on the economic growth rate for all three models. The coefficients of primary school enrollment show that primary school enrollment ratio has a significant positive effect on the economic growth rate for all three models. On the other hand, the female labor force participation rate is not significant in the three models. As mentioned above, the random effect model is appropriate for this analysis. Therefore, a 1% increase in total fertility rate is associated with a 1.614% decrease in economic growth. On
the other hand, a 1% increase in primary school enrollment ratio is associated with a 0.515% increase in economic growth.

Conclusion

Many different factors can affect economic growth rates. A fertility rate, which is a measure of the average number of children a woman will have during her childbearing years, is one of them. In this study, the relationship between fertility and economic growth is examined using panel data analysis. The dataset is tested for cross-section dependence by using the Lagrange Multiplier-LM test and the cross-section dependence is found. Therefore, second generation unit root tests are applied. Then the pooled OLS regression model, fixed effect model and random model are estimated. According to Hausman test and LM test, the random effect model is the appropriate model for this study. While the total fertility rate and the primary school enrollment ratio are significant, the female labor force participation rate is not significant. Highly significant and negative coefficient of fertility demonstrates that population growth adversely affects the economic growth. Positive and highly significant the primary school enrollment ratio coefficient implies that an increase in the primary school enrollment ratio will considerably contribute to economic growth. In this context, the policy makers should apply the fertility reduction policies and improve the education quality to increase the economic growth.
THE RELATIONSHIP BETWEEN FERTILITY RATE AND ECONOMIC GROWTH IN MENA COUNTRIES
İşin KORTAN SARAÇOĞLU

References


Yerdelen Tatoglu, F. (2013). Panel Veri Ekonometrisi. İstanbul: Beta

INTRODUCTION

Sugar production and the by-products provide very important contribution to the economies. Both in Turkey and in the EU, sugar production has a strategic importance. This is not only in the view of staple foods, but also, contribution to the other service sectors is very crucial such as logistics and transportation. Beet sugar represents only 20% of the world’s sugar production; the other sugar 80% is produced from sugar cane. Sugar sector is one of the most important sector in EU and Turkish Agriculture and food industry. Because of that (explained with the base of 2014 data):

- Sugar productions of EU and Turkey are respectively 11% and 1.2% of the world total sugar production in metric tones.
- EU is the biggest beet sugar producer and Turkey is the fifth beet sugar producer after Germany, France, (which are members of the EU), Russian Federation, and USA in the World.
- Sugar beet harvesting area of EU and Turkey are realized on 12.3% and 8% of the countries’ total cultivated area.
- Sugar beet production value of EU and Turkey are 2.1% and 1.8% of the total net production value of the countries’ agricultural economics.
- Sugar beet producers population of EU and Turkey are 0.3% and 2.4% of the countries’ total rural population.
- Labor forces working on sugar of EU and Turkey are 0.05% and 2.4% of the countries’ total industrial employment.
- EU’s sugar export and import share in the World’s trade are respectively, 17.2% and 21.7% are remarkable magnitudes (CEFS Sugar Statistics, EUROSTAT, FAOStat, ILOStat).

* Ankara Haci Bayram Veli University Faculty of Economics and Administrative Science Department of Economics, dikmen@gazi.edu.tr
** Ankara Haci Bayram Veli University Faculty of Economics and Administrative Science Department of Economics, emrebozdag@yahoo.com
When percentages, mentioned above, are compared to EU and Turkey, it is considered that the sugar production in Turkey is more important than in EU in terms of employment, and welfare. Sugar beet producers’ percentage of Turkey is 8 times bigger than of EU’s. Sugar factories’ labor forces percentage of Turkey is also more important than EU. The Turkey’s related percentage is 3.4 times bigger than EU’s. However, the net production values percentages of sugar beets in both of them are close to each others.

In agricultural area and in sugar industry, beet sugar production is labor intensive in Turkey, whereas production is capital intensive in EU. The capital formation has become inadequate for efficient production in Turkey. The reason that, the policy of privatization applications have entangled the technical and technological investments, which are essential for sustainable growth, on public owned sugar industries. The public sugar industry have been obliged to survive with its own resources in old style process modes.

EU, a substantial price determiner in sugar beet production, have also a crucial role in sugar World Trade. EU is a big dealer in World Trade, effects indirectly the World sugar production by the way of international trade. The table of the bottom is about the sugar cane and sugar beet prices trends in the countries, which have important roles in sugar production and trading in the World and Turkey. Even if Brazilian sugar cane prices and Germany sugar beet prices have positive trends, and others negative trends, Brazil, France and Germany shows the same cycle behaviors in ten-year period.

*Figure 1. The Sugar Cane and Sugar Beet Trends in Some Main Producers and Traders*
Beet sugar sector is involved in an interaction with many agricultural and industrial sectors. Therefore, sugar is a strategic food in economic life. Energy (bioenergies), logistic, chemical, pharmaceutical, food and beverage industries, (livestock) animal breeding, retailing and marketing, oversees trading are some example of interacting industries, which are served by-products of beet sugar industry. These by-products are mainly sugar, ethyl alcohol, beet pulp, and molasses.

**Literature Review**

There are a many studies related with efficiency of sugar production in the literature. Some of them published recently are below. These papers are mostly performed by data envelopment analysis and Malmquist index. Some of the studies are summarized follows.

Murtya, Kumarb and Paul (2006), also use DEA and Malmquist productivity index in their study named with “Environmental regulation, productive efficiency and cost of pollution abatement: A case study of the sugar industry in India”. They estimated input distance function for environmental efficiency. Marginal costs of pollution abatement functions are estimated for different pollutants of water. Pollutant specific taxes are computed using the tax-standards method.

Ezgi A. Demirtas, estimated efficiency of public sugar factories in Turkey in her study named with “A Data Envelopment-Based Clustering Approach for Public Sugar Factories in Privatizing Process”. This paper uses a new DEA- Data Envelopment Analysis based clustering approach for measuring efficiency scores of Public Sugar Factories and grouping them instead of geography- based portfolio groups. This new approach can help decision makers in privatizing process. At the same time, target values obtained by dual model can be used to eliminate inefficiencies of some public factories.

Salazar-Ordonez, Perez-Hernandez, Martin-Lozano (2013) performed to efficiency analysis of sugar beet for bio ethanol production in Spain. The name of their study is “Sugar beet for bio ethanol production: An approach based on environmental agricultural outputs”. They also used Data Envelopment Analysis for an empirical application. The results show that 4% of farms have full technical efficiency, while the rest have an average efficiency of 55.9%. In addition, it can not be said that there is a relationship between efficiency and farmscale. The consideration of aspects such as the environmental advantages of using sugar beet production for bio ethanol can open new lines of action to support this crop in the EU.

Bogetoft, Boye, Petersen, Nielsen, K. (2007) made an efficiency analysis to see effect of EU new sugar regime, for 234 sugar beet farm in Denmark by using DEA in 2003. Seed, fertilizer, chemicals, labor, physical capital, tax, depreciation and transportation cost were used as
inputs, while amount of sugar beet was taken as output. As a result of the study, they found that most of the farms were inefficient and if the new EU sugar policies are applied, the efficiency will increase.

Goncharuk (2009) performed a technical efficiency measurement for 44 sugar factories in Ukraine by using DEA for the year 2006. While, amount of sugar beet, labor force and depreciation were used as inputs, amount of crystal sugar was used as output. According to study, it is found that only five factories were efficient, the others were far away from efficient frontier.

Wu, Devadoss and Lu (2003) made a technical efficiency measurement for 147 sugar beet farms in USA by using DEA. While, seed, fertilizer, chemicals, labor, physical capital, quantity of irrigation, land were used as inputs, amount of total sugar beet was taken as output. As a result, it is found that only 45% of farms worked efficiently and average efficiency score was 0.88.

Methodology

In the economic literature, the concepts of “efficiency” and “productivity” are mostly mixed each other. The concept of efficiency can be defined as a ratio of actual amount of output produced by given input set, to the maximum amount of output that can be produced by these inputs. In other words, a firm is said to be technically efficient if a firm is producing the maximum output from the minimum quantity of inputs, such as labor, capital, and technology. On the other hand, “productivity” can be defined as a ratio of the output from the production process to the inputs used for this production.

Methods used for efficiency measurement are mainly divided into two categories: Parametric and nonparametric methods. Parametric methods, try to establish functional relationship between input and output by using econometric tools. Efficiency frontier in parametric methods is plotted taking into account the best average performance that can be obtained from the available observations. In the non-parametric methods, it is plotted taking into account the best performance among the existing observations. In this sense, DMU’s are evaluated within themselves and efficiency sequencing is made.

There are two reasons for deviation from efficiency frontier in parametric methods. These are called error term and inefficiency. On the other hand, all of these deviations are just called inefficiencies in non-parametric methods and these inefficiencies are not decomposed. It is assumed that all of the DMUs are homogeneous in parametric methods, but there is no such a restrictions in non-parametric methods. In addition to these, while parametric methods generally
estimate a multi-input single-output function, multi-input and multi-output efficiency measurements can be made in non-parametric methods.

The non-parametric methods used in this study are Data Envelopment Analysis (DEA) and Malmquist index based on linear programming. DEA can be either input-oriented or output-oriented. In the input-oriented case, the DEA method defines the frontier by seeking the maximum possible proportional reduction in input usage, with output levels held constant, for each DMU. While, in the output-oriented case, the DEA method seeks the maximum proportional increase in output production with input levels held fixed. The two measures provide the same technical efficiency scores when a constant returns-to-scale (CRS) technology applies, but are unequal when variable returns-to-scale (VRS) is assumed (Coelli, Rao, 2005:117).

DEA, basically, shows the relative efficiency of an economic decision unit and defines the efficiency as the ratio of total weighted outputs to total weighted inputs. Suppose that “k” shows the number of DMU, “m”, number of input and “s”, number of output and these inputs and outputs have positive values. Total factor productivity (TFP) of decision-making unit “k” can be represented as follows.

\[
TFP = \frac{\sum_{r=1}^{s} u_{rk}Y_{rk}}{\sum_{i=1}^{m} v_{ik}X_{ik}}
\]  

\( u_{rk}, r = 1, \ldots, s \): weight of total factor productivity for outputs

\( v_{ik}, i = 1, \ldots, m \): weight of total factor productivity for inputs

DEA analysis is based on solving the equation for each decision unit, finding the input and output weights of the decision units, and calculating the efficiency scores on the found values. We need some restrictions to ensure that efficiency scores are within certain range. This restriction is that upper bound of efficiency scores must be 1. This is represented as follows (Tarım, 2001: 50).

\[
\sum_{r=1}^{s} u_{rk}Y_{rf} \leq 1 \quad ; \quad j = 1, \ldots, n
\]

\[
\sum_{i=1}^{m} v_{ik}X_{ij} \leq 1 \quad ; \quad j = 1, \ldots, n
\]

\( u_{j} \geq 0 \quad ; \quad r = 1, \ldots, s \)

\( v_{ij} \geq 0 \quad ; \quad i = 1, \ldots, m \)
TECHNICAL EFFICIENCY OF SUGAR PRODUCTION IN EU AND TURKEY: Malmquist and Data Envelopment Analysis Approach
Fatih Hakan DİKMEN, Emre Güneşer BOZDAG

The total factor productivity function to be maximized within the constraint equation given in # 3 is shown below (Trueblood, Coggins, 2003:9).

\[
\max h_k = \frac{\sum_{r=1}^{s} h_{rk}Y_{rk}}{\sum_{r=1}^{m} v_{ik}X_{ik}}
\]  

(4)

The second non-parametric method is Malmquist Index, which is also based on linear programming. The main purpose of this index is measure to productivity change in time and make policy proposal. The most important advantage of using Malmquist index is that there is no need to know input or output prices (Dikmen, Bozdağ, 2017: 127). Developed by Caves, D., & Christensen, L., & Diewert, W. (1982), Malmquist is named after Sten Malmquist, who first invented the idea of indexing with distance functions (Tarim, A., 2001, ss. 152).

The Malmquist index is defined using distance function. Distance functions describe a multi-input, multi-output production technology without the need to specify a behavioral objective (such as cost minimization or profit maximization). Both input distance function and output distance function may be defined. An input distance function characterizes the production technology by looking at a minimal proportional contraction of the input vector, given an output vector. However, an output distance function characterizes the production technology by looking at a maximum proportional increase in the output vector, given an input vector (Coelli, Rao, 2005:118). Output based Malmquist productivity index can be defined as follows.

\[
M_0(x_s, y_s, x_t, y_t) = \left[ \frac{d^*_{0}(y_t, x_t) d^*_0(y_r, x_r)}{d^*_{0}(y_s, x_s) d^*_0(y_s, x_s)} \right]^{1/2}
\]

(5)

Where the notation \(d^*_{0}(y_t, x_t)\) represents the distance from the period \(t\) observation to the period \(s\) technology. A value of \(M_0\) greater than 1 will indicate positive TFP growth from period \(s\) to period \(t\) while a value less than one indicates a TFP decline (Coelli, Rao, 2005:118). Equation 5 can also be written as:

\[
M_0(x_s, y_s, x_t, y_t) = \frac{d^*_0(y_t, x_t)}{d^*_{0}(y_s, x_s)} \left[ \frac{d^*_{0}(y_r, x_r)}{d^*_{0}(y_s, x_s)} \right]^{1/2}
\]

(6)

At the last equation, while the first part refers to change in efficiency, second part refers to technological change (Coelli, Rao, 2005:118).
Technical Efficiency Change (TEC) = \frac{d_t^e(y_t, x_t)}{d_o^e(y_t, x_t)} \quad (7)

Technological Change (TC) = \left[ \frac{d_t^e(y_t, x_t)}{d_o^e(y_t, x_t)} \times \frac{d_t^e(y_t, x_t)}{d_o^e(y_t, x_t)} \right]^{1/2} \quad (8)

The change in total factor productivity equals the multiply of technological change and technological change. The fact that the multiply value is greater than one means that the TFP increases from (t) to (t + 1), and if it is smaller than one, it decreases.

**Empirical Results**

The aim of this study is to measure the efficiency of sugar production for EU countries and Turkey between the years 2010-2016. In this study, both Data envelopment analysis (DEA) and Malmquist index were used to find the production efficiency scores and changes. DEA and Malmquist Index were made with input oriented, under the assumption of constant returns to scale. After determining the most efficient DMU’s, super efficiency analysis were made for comparing them with each other. While, these measurements of technical efficiency (DEA and Malmquist Index) were performed by using DEAP V2.1 package software program which developed by Coelli, super efficiency measurement was performed by using EMS (Efficiency Measurement System).

The inputs used for measuring efficiency are farmers, arable beet area, factory workers and amount of processed beet and the outputs are crystal sugar and molasses. Both inputs and outputs have been normalized by dividing into number of factories in order to scale the production of countries.

Technical efficiency scores are given for the all countries and related years under the assumption of constant returns to scale at Table 1. If the efficiency score equals the “1”, full technical efficiency has been achieved. If it is smaller than one, it is called “inefficiency”. Accordingly, countries that can be taken as references fully efficient during the related period are Belgium, Denmark, France, Netherland, Spain and UK. On the other side, the least efficient country is Turkey. It was observed an increase in efficiency at 2014 in Turkey, but decrease in efficiency has continued on following years.
Table 1. Technical Efficiency Scores for EU Countries and Turkey: 2010-2016

<table>
<thead>
<tr>
<th>YEARS</th>
<th>COUNTRIES</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Austria</td>
<td>0.948</td>
<td>0.963</td>
<td>0.958</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>0.981</td>
</tr>
<tr>
<td></td>
<td>Belgium</td>
<td>1.000</td>
<td>0.997</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Denmark</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Finland</td>
<td>0.890</td>
<td>0.990</td>
<td>0.967</td>
<td>0.885</td>
<td>0.966</td>
<td>0.956</td>
<td>0.891</td>
<td>0.935</td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Germany</td>
<td>0.955</td>
<td>1.000</td>
<td>0.981</td>
<td>1.000</td>
<td>0.979</td>
<td>0.986</td>
<td>0.985</td>
<td>0.984</td>
</tr>
<tr>
<td></td>
<td>Greece</td>
<td>1.000</td>
<td>0.868</td>
<td>1.000</td>
<td>0.931</td>
<td>1.000</td>
<td>0.839</td>
<td>0.785</td>
<td>0.918</td>
</tr>
<tr>
<td></td>
<td>Italy</td>
<td>0.997</td>
<td>0.942</td>
<td>0.888</td>
<td>0.938</td>
<td>0.933</td>
<td>0.876</td>
<td>1.000</td>
<td>0.939</td>
</tr>
<tr>
<td></td>
<td>Netherlands</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Spain</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Sweden</td>
<td>0.944</td>
<td>0.946</td>
<td>0.930</td>
<td>0.945</td>
<td>0.951</td>
<td>0.944</td>
<td>0.967</td>
<td>0.947</td>
</tr>
<tr>
<td></td>
<td>UK</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Czech Rep.</td>
<td>0.981</td>
<td>1.000</td>
<td>0.953</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>0.991</td>
</tr>
<tr>
<td></td>
<td>Hungary</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>0.880</td>
<td>1.000</td>
<td>0.983</td>
</tr>
<tr>
<td></td>
<td>Lithuania</td>
<td>0.887</td>
<td>0.918</td>
<td>0.935</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>0.980</td>
<td>0.960</td>
</tr>
<tr>
<td></td>
<td>Poland</td>
<td>0.882</td>
<td>0.923</td>
<td>0.963</td>
<td>0.955</td>
<td>1.000</td>
<td>0.979</td>
<td>0.967</td>
<td>0.953</td>
</tr>
<tr>
<td></td>
<td>Slovakia</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Romania</td>
<td>1.000</td>
<td>1.000</td>
<td>0.930</td>
<td>0.959</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>0.984</td>
</tr>
<tr>
<td></td>
<td>Croatia</td>
<td>0.987</td>
<td>0.889</td>
<td>0.953</td>
<td>1.000</td>
<td>0.861</td>
<td>0.857</td>
<td>0.810</td>
<td>0.908</td>
</tr>
<tr>
<td></td>
<td>Turkey</td>
<td>0.786</td>
<td>0.719</td>
<td>0.808</td>
<td>0.792</td>
<td>0.890</td>
<td>0.764</td>
<td>0.818</td>
<td>0.797</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>0.963</td>
<td>0.958</td>
<td>0.963</td>
<td>0.97</td>
<td>0.979</td>
<td>0.954</td>
<td>0.96</td>
<td>0.964</td>
</tr>
</tbody>
</table>

While the average efficiency score for all countries and years is 0.964, Turkey's average score is only 0.797. As we can see, this score is well below the average.

Table 2 is given for following the change in efficiencies. If the value of total factor productivity change greater than one, it means that there is an increase in TFP. If it is less than one, it states that TFP decreases. TFPC is divided in two as TED and TD and the interpretations of the results are same. In other words, if the change in TED and TD is greater than one, it means an increase in both technical efficiency and technological change (Dikmen, Bozdağ, 2017:135). Change in technical efficiency (TEC) is also divided in two as pure efficiency change (PEC) and scale efficiency change (SEC). It can be easily seen that TFPC equals to multiplication of TEC and TC, and TEC equals to multiplication of PEC and SEC. Scale efficiency refers to the ability of a firm to produce at an optimum scale to provide cost minimization.
Table 2. Annual Means of Malmquist Index Values: 2010-2016

<table>
<thead>
<tr>
<th></th>
<th>TEC</th>
<th>TC</th>
<th>PEC</th>
<th>SEC</th>
<th>TFPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>1.009</td>
<td>0.995</td>
<td>1.000</td>
<td>1.009</td>
<td>1.004</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.000</td>
<td>0.994</td>
<td>1.000</td>
<td>1.000</td>
<td>0.994</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.000</td>
<td>0.997</td>
<td>1.000</td>
<td>1.000</td>
<td>0.997</td>
</tr>
<tr>
<td>Finland</td>
<td>1.000</td>
<td>0.997</td>
<td>0.999</td>
<td>1.001</td>
<td>0.998</td>
</tr>
<tr>
<td>France</td>
<td>1.000</td>
<td>0.991</td>
<td>1.000</td>
<td>1.000</td>
<td>0.991</td>
</tr>
<tr>
<td>Germany</td>
<td>1.005</td>
<td>0.993</td>
<td>1.003</td>
<td>1.003</td>
<td>0.998</td>
</tr>
<tr>
<td>Greece</td>
<td>0.960</td>
<td>0.962</td>
<td>1.000</td>
<td>0.960</td>
<td>0.924</td>
</tr>
<tr>
<td>Italy</td>
<td>1.001</td>
<td>0.988</td>
<td>1.000</td>
<td>1.001</td>
<td>0.989</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1.000</td>
<td>0.976</td>
<td>1.000</td>
<td>1.000</td>
<td>0.976</td>
</tr>
<tr>
<td>Spain</td>
<td>1.000</td>
<td>0.990</td>
<td>1.000</td>
<td>1.000</td>
<td>0.990</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.004</td>
<td>0.993</td>
<td>0.996</td>
<td>1.008</td>
<td>0.997</td>
</tr>
<tr>
<td>UK</td>
<td>1.000</td>
<td>1.012</td>
<td>1.000</td>
<td>1.000</td>
<td>1.012</td>
</tr>
<tr>
<td>Czech Rep.</td>
<td>1.003</td>
<td>0.995</td>
<td>1.000</td>
<td>1.003</td>
<td>0.998</td>
</tr>
<tr>
<td>Hungary</td>
<td>1.000</td>
<td>0.953</td>
<td>1.000</td>
<td>1.000</td>
<td>0.953</td>
</tr>
<tr>
<td>Lithuania</td>
<td>1.017</td>
<td>0.986</td>
<td>1.000</td>
<td>1.017</td>
<td>1.002</td>
</tr>
<tr>
<td>Poland</td>
<td>1.016</td>
<td>0.991</td>
<td>1.010</td>
<td>1.005</td>
<td>1.007</td>
</tr>
<tr>
<td>Slovakia</td>
<td>1.000</td>
<td>0.995</td>
<td>1.000</td>
<td>1.000</td>
<td>0.995</td>
</tr>
<tr>
<td>Romania</td>
<td>1.000</td>
<td>1.026</td>
<td>1.000</td>
<td>1.000</td>
<td>1.026</td>
</tr>
<tr>
<td>Croatia</td>
<td>0.968</td>
<td>0.999</td>
<td>1.000</td>
<td>0.968</td>
<td>0.967</td>
</tr>
<tr>
<td>Turkey</td>
<td>1.007</td>
<td>0.993</td>
<td>1.007</td>
<td>0.999</td>
<td>1.000</td>
</tr>
<tr>
<td>Mean</td>
<td>0.999</td>
<td>0.991</td>
<td>1.001</td>
<td>0.999</td>
<td>0.991</td>
</tr>
</tbody>
</table>

TEC: Technical Efficiency Change
TC: Technological Change
PEC: Pure Efficiency Change
SEC: Scale Efficiency Change
TFPC: Total Factor Productivity Change

According to the table, the country with the highest TFPC is Romania with 1.026. It means that there is an increase a 2.6% in total factor productivity, related period. This value is 1 for Turkey and it means that there is no change in TFP between the years 2010-2016. On the other hand, the country which has the lowest TFPC is Greece with 0.924. It means that there is a decrease a 7.6% in total factor productivity. If we evaluate technological change for all countries and years, the average change is 0.991, which means a technological decline of 0.9%
for the period concerned. Apart from this, there is no significant change in other parameters, as can be seen from the table.

Finally, in the following tables, super efficiency scores are given. What we want to do here is to compare the countries, which has full efficiency score within themselves.

<table>
<thead>
<tr>
<th>COUNTRIES</th>
<th>YEARS</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>2010©</td>
<td>94,85%</td>
<td>96,28%</td>
<td>95,79%</td>
<td>101,72%</td>
<td>106,38%</td>
<td>138,24%</td>
<td>101,21%</td>
<td>104,92%</td>
</tr>
<tr>
<td>Belgium</td>
<td>2011©</td>
<td>103,42%</td>
<td>99,68%</td>
<td>101,71%</td>
<td>103,93%</td>
<td>103,47%</td>
<td>101,06%</td>
<td>104,21%</td>
<td>102,50%</td>
</tr>
<tr>
<td>Denmark</td>
<td>2012©</td>
<td>103,23%</td>
<td>115,18%</td>
<td>123,78%</td>
<td>119,96%</td>
<td>119,11%</td>
<td>107,74%</td>
<td>104,35%</td>
<td>113,34%</td>
</tr>
<tr>
<td>Finland</td>
<td>2013©</td>
<td>89,05%</td>
<td>98,98%</td>
<td>96,73%</td>
<td>88,46%</td>
<td>96,62%</td>
<td>95,56%</td>
<td>89,07%</td>
<td>93,50%</td>
</tr>
<tr>
<td>France</td>
<td>2014©</td>
<td>112,73%</td>
<td>112,28%</td>
<td>121,00%</td>
<td>120,08%</td>
<td>125,78%</td>
<td>104,80%</td>
<td>107,83%</td>
<td>114,93%</td>
</tr>
<tr>
<td>Germany</td>
<td>2015©</td>
<td>95,51%</td>
<td>102,61%</td>
<td>98,11%</td>
<td>101,91%</td>
<td>97,86%</td>
<td>98,56%</td>
<td>98,47%</td>
<td>99,00%</td>
</tr>
<tr>
<td>Greece</td>
<td>2016©</td>
<td>174,43%</td>
<td>86,83%</td>
<td>111,80%</td>
<td>93,14%</td>
<td>103,34%</td>
<td>83,86%</td>
<td>78,47%</td>
<td>104,55%</td>
</tr>
<tr>
<td>Italy</td>
<td>2010©</td>
<td>99,66%</td>
<td>94,21%</td>
<td>88,77%</td>
<td>93,77%</td>
<td>93,31%</td>
<td>87,61%</td>
<td>109,88%</td>
<td>95,32%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2011©</td>
<td>196,14%</td>
<td>153,94%</td>
<td>138,99%</td>
<td>135,27%</td>
<td>125,30%</td>
<td>135,24%</td>
<td>172,53%</td>
<td>151,06%</td>
</tr>
<tr>
<td>Spain</td>
<td>2012©</td>
<td>127,43%</td>
<td>123,07%</td>
<td>107,20%</td>
<td>117,56%</td>
<td>105,00%</td>
<td>117,38%</td>
<td>114,18%</td>
<td>115,97%</td>
</tr>
<tr>
<td>Sweden</td>
<td>2013©</td>
<td>94,38%</td>
<td>94,58%</td>
<td>93,02%</td>
<td>94,48%</td>
<td>95,14%</td>
<td>94,38%</td>
<td>96,72%</td>
<td>94,67%</td>
</tr>
<tr>
<td>UK</td>
<td>2014©</td>
<td>118,51%</td>
<td>100,56%</td>
<td>108,09%</td>
<td>108,25%</td>
<td>115,95%</td>
<td>135,18%</td>
<td>185,71%</td>
<td>124,61%</td>
</tr>
<tr>
<td>Czech Rep.</td>
<td>2015©</td>
<td>98,13%</td>
<td>102,71%</td>
<td>95,34%</td>
<td>105,75%</td>
<td>107,67%</td>
<td>113,00%</td>
<td>111,63%</td>
<td>104,89%</td>
</tr>
<tr>
<td>Hungary</td>
<td>2016©</td>
<td>125,50%</td>
<td>111,54%</td>
<td>143,15%</td>
<td>120,77%</td>
<td>112,00%</td>
<td>88,05%</td>
<td>127,11%</td>
<td>118,30%</td>
</tr>
<tr>
<td>Lithuania</td>
<td>2010©</td>
<td>88,72%</td>
<td>91,76%</td>
<td>93,52%</td>
<td>105,60%</td>
<td>101,13%</td>
<td>104,12%</td>
<td>98,04%</td>
<td>97,56%</td>
</tr>
<tr>
<td>Poland</td>
<td>2011©</td>
<td>88,16%</td>
<td>92,26%</td>
<td>96,26%</td>
<td>95,33%</td>
<td>103,18%</td>
<td>97,86%</td>
<td>96,72%</td>
<td>95,71%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>2012©</td>
<td>118,36%</td>
<td>118,82%</td>
<td>157,53%</td>
<td>135,56%</td>
<td>165,13%</td>
<td>251,54%</td>
<td>183,27%</td>
<td>161,46%</td>
</tr>
<tr>
<td>Romania</td>
<td>2013©</td>
<td>105,23%</td>
<td>116,36%</td>
<td>93,05%</td>
<td>95,89%</td>
<td>118,50%</td>
<td>108,66%</td>
<td>133,77%</td>
<td>110,21%</td>
</tr>
<tr>
<td>Croatia</td>
<td>2014©</td>
<td>98,70%</td>
<td>88,91%</td>
<td>95,32%</td>
<td>105,28%</td>
<td>86,12%</td>
<td>85,72%</td>
<td>80,95%</td>
<td>91,57%</td>
</tr>
<tr>
<td>Turkey</td>
<td>2015©</td>
<td>78,64%</td>
<td>71,88%</td>
<td>80,79%</td>
<td>79,18%</td>
<td>89,02%</td>
<td>76,43%</td>
<td>81,79%</td>
<td>79,68%</td>
</tr>
<tr>
<td>Mean %</td>
<td>96,77</td>
<td>96,75</td>
<td>96,83</td>
<td>96,87</td>
<td>96,94</td>
<td>97,01</td>
<td>97,08</td>
<td>96,89</td>
<td></td>
</tr>
</tbody>
</table>

As to be remembered at first table, Belgium, Denmark, France, Netherland, Spain and UK were the most efficient sugar producers and their efficiency score was 1. These countries are on the efficient frontier for all years. If we reorder for these countries in terms of efficiency, Slovakia takes in to first place as 161,46%. Netherland, not surprisingly, takes into second place as 151,06%. Hungary is also seen as very efficient producer as 118,3%, but she was under the efficient frontier in 2015. That's why we didn't take her into most efficient countries ranking.
Conclusion

In this study, the technical efficiency of sugar production for EU countries and Turkey were made, between the years 2010-2016. Data envelopment analysis (DEA) and Malmquist index were used to find the production efficiency scores and changes. DEA and Malmquist Index were performed with input oriented, under the assumption of constant returns to scale. After reaching the efficiency scores, technical efficiency change, technological change, scale efficiency change and total factor productivity change were calculated with Malmquist index. As a final step, super efficiency analysis were made for comparing the most efficient DMUs with each other.

According to DEA, Belgium, Denmark, France, Netherland, Spain and UK are the most efficient countries and they are compose of reference frontier. On the other hand, Turkey has the least efficient country as with 0,797 scores. Average efficiency score for all countries and years is 0,964 and Turkey is well below the average.

According to the Malmquist Index, the country with the highest TFPC is Romania with 1,026. It means that there is an increase a 2,6 % in total factor productivity, related period. This value is 1 for Turkey and it means that there is no change in TFP between the years 2010-2016. On the other hand, the country, which has the lowest TFPC, is Greece with 0,924. It means that there is a decrease a 7,6 % in total factor productivity.

Finally, if we want to compare to most efficient countries within themselves, super efficiency scores will help us. Accordingly, Slovakia and Netherland take into first to place among the six countries.

In the light of all data and results, sugar production in Turkey can be interpreted as follows. When it is compared to EU countries, sugar production in Turkey is more labor intensive production process. Unfortunately, the sugar factories in Turkey have been working with very old machines. Almost, there has been no investment since the 1950. In spite of privatization, it is not made a significant progress in terms of efficiency. The most important reasons are managerial inefficiency and inadequate capital investments. Modernization of the capital infrastructure is crucial in order to compete with the European Union countries. When considering the importance of employment in the economy, in order to increase production efficiency, it seems more appropriate to increase the number of physical capital, instead of decreasing in employment.
References


www.fao.org/faostat/en/#data
www.cefs.org/statistics
www.ilo.org/ilostat
www.pankobirlik.com.tr
www.tarim.gov.tr/SDB
www.tuik.gov.tr
www.turkseker.gov.tr
www.tzob.org.tr
1. Introduction

Thanks to rapid advancements on technology, the new processes of production, marketing and delivering for firms began to be used and this condition enhanced the national and international competition. In order to survive in this new competitive system, firms must follow technology closely. For this reason, the firms that desired to monopolize the competitive power have to invest on Information Communication Technologies (ICT) and Research and Development (R & D). There are widespread opinions in economics literature that technological investments, in other words, the productivity of the investments to ICT and R & D will increase the growth of economy. (See: Griliches, 1991). When it is conceived that R & D investments will bring along patent investments in later, patent investments affect value added and productivity positively (See: Corrado, Hulten and Sichel, 2009; Marrano, Haskel and Wallis, 2009).

Thanks to advanced technological infrastructure and the easiness to find data in developed countries, in the studies, the impact of ICT and R & D investments on value added and productivity have been researched in a widespread manner. In Turkey, however, there is no such study which evaluated these two variables at the same time. Yet, there are few studies which investigated ICT and R & D investments separately. In Turkey, the first study which investigated the impact of ICT investments on productivity in a firm level has been made by Kılıçarslan and others (2017) with the industrial and service statistics of Turkish Statistical Institute. The result of analysis, which aimed to find the impact of ICT investments on productivity and total factor productivity in manufacturing industry and sub-sector groups in 2003-2010, demonstrated that ICT investments are more efficient than (traditional) capital investments in this study.

Another study, which investigated the impact of ICT and patent investments on value added in Turkish manufacturing industry, has been made by Gürel Üçdoğruk and Kılıçaslan (2016). In the study, generalized method of moments (GMM) and Olley Pakes methods utilized, firms

* Bartin University, Department of Economics, Bartin, Turkey, gguney@bartin.edu.tr
have been analyzed in accordance with the classification of their magnitude and technological intensity, and both ICT and patent investments affected value added positively in the result of analysis.

Studies, which aimed to measure the impact of R & D investments, are usually in macro level in Turkey. The impact of R & D expenditures on total factor productivity, GDP and export has been researched and positive conclusions have been found. (See, Yıldırım and Kesikoğlu, 2012; Fikirli and Çetin, 2015; Bayraktutan and Kethudağlı, 2017). As far as it is known, one of the first study about R & D in firm level was made by Lenger and Taymaz (2006) in Turkey. In this study, which innovation and technological transfer activities of domestic and foreign companies in Turkish manufacturing industry and labor spreads are examined, it is concluded that the R & D intensity encourages innovation in the Turkish manufacturing companies and affected the output level positively.

Another study which is associated with R & D is the study of Ülkü and Pamukçu (2015). In the study, the impact of R & D intensity and the spread of information channel in Turkish manufacturing industry firms on productivity has been researched in 2003-2007. After the research, it is observed that R & D investments affected productivity positively in the firms which are above in a certain technological level. It is observed in the study that foreign capital share and technology licences, which are used in the study as variables, affected productivity positively as well, but the effect of technology license is significant only in the firms which can afford the higher technology.

In this study, it is aimed to measure the impact of technological investments (ICT and R & D) in Turkish manufacturing industry and service sectors on firm valued added, and also aimed that whether this impact is different in the firms of manufacturing industry and service sectors in Turkey or not.

Therefore, in our study, the impact of technological investments to the value added at the firm level in the Turkish manufacturing industry and service sector between 2009 and 2015 was analyzed with the Olley-Pakes method, in order to avoid the problem of endogeneity, which is very common in studies based on firm-industry, and random effects model.

The pattern of the study; the examples of empirical studies are given in chapter 2. In chapter 3, the introduction of data set, the methodology which seek to measure the traditional and other capital stocks, and a short illustrator analysis are given. Econometric analysis method is explained in chapter 4. The results of econometric analysis are evaluated in the next chapter. The result of the study is discussed in the final section.
Literature Review

Productivity increases occurred in USA and many developed countries in 1990s remarkably. It is asserted that these productivity increases happened thanks to ICT investments. However, the impact of ICT investments was not revealed in empirical studies in this period transparently. The reflection of the impact of ICT investments in empirical studies could be seen in the late 1990s. (See: Brynjolfsson and Yang, 1999; Stiroh, 2002; Atrostic et al., 2004; Mäleranta and Rouvinen, 2004; Ollo-Lopez and Aramendia-Muneta, 2012; O’Mahony and Vecchi 2009; Venturini 2009; Brynjolfsson and Hitt, 2003; Chen et al 2016).

Technological advancement increased the importance of R & D investments too. The impact of the productivity of R & D is penetrated into literature with the study of Zvi Griliches in 1973. In the ongoing studies, the impact of R & D investments on productivity and value added in the firm level have been observed positively (See: Griliches 1979; Hall and Mairesse, 1995; Los and Verspagen, 2000; Rogers, 2006; O’Mahony ve Vecchi 2009; Ortega-ArGilés, Piva, Potters, and Vivarelli, 2010; Doraszelski and Jaumandreu, 2013; Ortega-ArGilés, Piva, and Vivarelli, 2015; Castellani, Piva, Schubert and Vivarelli, 2016). In case for the studies of Pakes and Griliches (1984); they examined patent and R & D investments together and revealed that the positive impacts of patent and R & D on productivity. However, ICT and R & D investments analyzed separately in these studies.

The number of studies, which analyzed both ICT and R & D investments together, are limited in the literature of economics. Matteucci and Sterlacchini (2004); in their analysis, which they made with 3918 manufacturing industries in 1998-2000, they observed that both ICT and R & D intensities have possible affect on value added and TFP. Cette, Lopez and Mairesse (2013); in their analysis, which they researched 13 industrial sectors in 15 OECD countries for the period of 1987-2007, they investigated the impact of ICT and R & D investments on TFP and they reported that both of them have a positive affect, although the impact of R & D investments are more common. Bonanno (2016) analysis, has been studied with 2691 Italian firms for the period of 2007-2009. Bonanno concluded that both ICT and R & D investments have a positive and high affect on value added. Pieri, Vecchi and Venturini (2017); in their studies, which included 19 sectors in 14 OECD countries in 1973-2007, they examined the impact of ICT and R & D investments on productivity and they concluded that ICT and R & D investments affected productivity positively and it contained 95% of TFP growth in OECD countries. Edquist and Henrekson (2017a); in their analysis, which they made upon 50 industries in Sweden in 1993-2013, they reported that ICT and R & D investments have affected TFP positively for each sector and R & D investments affected TFP growth in short term, but only ICT investments expanded their positive affects in a long term. Edquist and Henrekson (2017b); in their analysis, which they used 47 industrial data in Sweden, concluded that the output elasticity of ICT and R & D has been estimated for the period of 1993-2012,
and ICT and R & D investments have a positive relationship with value added increase. Corrado et al (2017); the data of 10 EU countries have been used in order to analyze indirect effects of BIT and intangible assets in their analysis. Indirect effects have been found in exclusive intangible effects and R & D. Yet, it has been found that ICT does not have a significant relationship with TFP.

The Data and Descriptive Analysis

In this study, used data in analysis, were obtained from Turkish Statistical Institute’s Annual Statistics of Industry and Service (2015) and the Statistics of R & D of Industrial/Service Foundations (2015). In order to prepare the data, both Annual Statistics of Industry and Service and the statistics of R & D of Industrial/Service Foundations have been analyzed separately by years and they have been controlled in order to check the consistency of variables over the years. By removing inconsistencies, each two data base belong to the data have been unified separately by the period of 2009-2015 and in the last editing, these two data base have been unified together on the basis of firms. During the unification of data bases of Annual Statistics of Industry and Service and the statistics of R & D of Industrial/Service, a lot of data loss happened because the sample structure of these two data bases was not congruent enough.

The firms’ data, which have 20 employees and more, and contained analysis from the years of 2009-2015, have been used. Total of 4073 firm data from 3069 firms of manufacturing industry and 1004 firms of service sector, and 11918 observations have been utilized in order to perform this analysis. By years, both the observation numbers of manufacturing industry and service sector have been given in Table 1.

Table 1. Number of Observations

<table>
<thead>
<tr>
<th>Year</th>
<th>All</th>
<th>Manufacturing</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>1249</td>
<td>1029</td>
<td>220</td>
</tr>
<tr>
<td>2010</td>
<td>1565</td>
<td>1248</td>
<td>317</td>
</tr>
<tr>
<td>2011</td>
<td>1713</td>
<td>1348</td>
<td>365</td>
</tr>
<tr>
<td>2012</td>
<td>1931</td>
<td>1490</td>
<td>441</td>
</tr>
<tr>
<td>2013</td>
<td>1558</td>
<td>1196</td>
<td>362</td>
</tr>
<tr>
<td>2014</td>
<td>1960</td>
<td>1478</td>
<td>482</td>
</tr>
<tr>
<td>2015</td>
<td>1942</td>
<td>1422</td>
<td>520</td>
</tr>
</tbody>
</table>

*Source: Annual Industry and Service Statistics Database and Industry / Service Organizations Research-Development (R&D) Statistics Database TURKSTAT*
Because there are no capital stock data in TURKSTAT’s Annual Statistics of Industry, capital stock is calculated for all variables which is related to capital separately. Since capital is considered as the accumulation of investments, which are made in previous periods, calculation of capital stock is problematical. In order to calculate the capital stock, perpetual inventory method (PIM), which its equation is below mentioned, has been used. According to this: r; rental expense, fr; leasing expenditures K; capital, i; investments, d; depreciation rate represents.

\[
K_t = \frac{(Amortisman_t + r_t + f r_t)}{d}
\]

\[
K_{t+1} = K_t + i_{t+1} - d^*K_t
\]

In accordance with this methodology, the capital stock of starting year is calculated with depreciation. Depreciation rate is %7.5 for tangible fixed assets, depreciation rate is %16.1 for ICT related tangible fixed assets, depreciation rate is %31.5 for intangible assets which is related to ICT (computer softwares), (Edquist and Henrekson, 2017b, p.30) and depreciation rate is %15 for patent and R & D investments (Corrado, Haskel, Jona-Lasinio and Iommi, 2016, p.6). We started to calculate capital stock from the year 2003 to get accumulation of investments.

Because the price index of service sector is non-available, both the data of service sector and manufacturing industry made real by the price indices of four digit manufacturing industries which obtained from Turkish Statistical Institute.

### Table 2. Proportion of Firms with Respective Technology Investment

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>0.84</td>
<td>0.30</td>
<td>0.33</td>
<td>0.47</td>
<td>0.85</td>
<td>0.30</td>
<td>0.33</td>
<td>0.47</td>
<td>0.77</td>
<td>0.30</td>
<td>0.33</td>
<td>0.46</td>
</tr>
<tr>
<td>2010</td>
<td>0.85</td>
<td>0.27</td>
<td>0.33</td>
<td>0.51</td>
<td>0.89</td>
<td>0.28</td>
<td>0.33</td>
<td>0.52</td>
<td>0.68</td>
<td>0.25</td>
<td>0.34</td>
<td>0.49</td>
</tr>
<tr>
<td>2011</td>
<td>0.85</td>
<td>0.29</td>
<td>0.36</td>
<td>0.56</td>
<td>0.89</td>
<td>0.30</td>
<td>0.37</td>
<td>0.56</td>
<td>0.72</td>
<td>0.23</td>
<td>0.33</td>
<td>0.52</td>
</tr>
<tr>
<td>2012</td>
<td>0.85</td>
<td>0.28</td>
<td>0.35</td>
<td>0.57</td>
<td>0.90</td>
<td>0.29</td>
<td>0.36</td>
<td>0.57</td>
<td>0.70</td>
<td>0.24</td>
<td>0.34</td>
<td>0.58</td>
</tr>
<tr>
<td>2013</td>
<td>0.79</td>
<td>0.34</td>
<td>0.35</td>
<td>0.79</td>
<td>0.83</td>
<td>0.35</td>
<td>0.36</td>
<td>0.79</td>
<td>0.66</td>
<td>0.29</td>
<td>0.31</td>
<td>0.77</td>
</tr>
<tr>
<td>2014</td>
<td>0.72</td>
<td>0.29</td>
<td>0.33</td>
<td>0.59</td>
<td>0.77</td>
<td>0.31</td>
<td>0.35</td>
<td>0.59</td>
<td>0.56</td>
<td>0.22</td>
<td>0.26</td>
<td>0.57</td>
</tr>
<tr>
<td>2015</td>
<td>0.73</td>
<td>0.27</td>
<td>0.37</td>
<td>0.60</td>
<td>0.79</td>
<td>0.29</td>
<td>0.39</td>
<td>0.61</td>
<td>0.55</td>
<td>0.21</td>
<td>0.32</td>
<td>0.58</td>
</tr>
</tbody>
</table>

*Source: Annual Industry and Service Statistics Database and Industry / Service Organizations Research-Development (R&D) Statistics Database TURKSTAT*
investment, and approximately %55 of them made R & D investment. When the technological investment rates of the firms, which are active in manufacturing industry, are observed, the similarities with general group pointed out. While approximately %85 of firms made ICT investment, approximately %30 of them made computer investment, approximately %35 of them made patent investment, and approximately %55 of them made R & D investment. Although the technological investment rates of the firms, which are active in the service sector, are relatively low in comparison with the firms of manufacturing industry, there is no much deviation in the average of general group. When the technological rates of the firms, which are active in the service sector, are observed, approximately %70 of them made ICT investment, approximately %25 percent of them made computer software investment, approximately %30 percent of them made patent investment, and approximately %50 of them made R & D investment.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>14,16</td>
<td>15,33</td>
<td>14,79</td>
<td>15,95</td>
<td>14,78</td>
<td>15,85</td>
<td>14,78</td>
<td>15,85</td>
</tr>
<tr>
<td>2010</td>
<td>14,08</td>
<td>15,16</td>
<td>14,71</td>
<td>15,76</td>
<td>14,67</td>
<td>15,66</td>
<td>14,67</td>
<td>15,66</td>
</tr>
<tr>
<td>2011</td>
<td>14,26</td>
<td>15,21</td>
<td>14,75</td>
<td>15,87</td>
<td>14,71</td>
<td>15,70</td>
<td>14,71</td>
<td>15,70</td>
</tr>
<tr>
<td>2012</td>
<td>14,14</td>
<td>15,18</td>
<td>14,73</td>
<td>15,79</td>
<td>14,72</td>
<td>15,59</td>
<td>14,72</td>
<td>15,59</td>
</tr>
<tr>
<td>2013</td>
<td>14,42</td>
<td>15,43</td>
<td>14,91</td>
<td>15,81</td>
<td>14,91</td>
<td>15,78</td>
<td>14,91</td>
<td>15,78</td>
</tr>
<tr>
<td>2014</td>
<td>14,69</td>
<td>15,45</td>
<td>15,00</td>
<td>15,82</td>
<td>14,95</td>
<td>15,81</td>
<td>14,95</td>
<td>15,81</td>
</tr>
<tr>
<td>2015</td>
<td>14,56</td>
<td>15,56</td>
<td>15,00</td>
<td>16,06</td>
<td>14,94</td>
<td>15,86</td>
<td>14,94</td>
<td>15,86</td>
</tr>
</tbody>
</table>

*Source: Annual Industry and Service Statistics Database and Industry / Service Organizations Research-Development (R&D) Statistics Database TURKSTAT*

The firms which invested in technology are created more significant value-added than the firms which did not invest in technology and this result can be seen in the group which evaluated separately in both Table 3, which includes all firms, Table 4, which includes the firms of manufacturing industries, and Table 5, which includes the firms of service sector.
ECONOMIC ISSUES IN RETROSPECT AND PROSPECT II
Alexandra Górecka (PhD), Assoc Prof. Altuğ M. Köktaş, Agnieszka Parlińska (PhD)

Table 4. Value Added Differences between Non-investors and Investors for Manufacturing Firms

<table>
<thead>
<tr>
<th>Year</th>
<th>ICT</th>
<th>Com. Soft.</th>
<th>Patent</th>
<th>R&amp;D</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>14,08</td>
<td>15,35</td>
<td>14,80</td>
<td>16,01</td>
</tr>
<tr>
<td>2010</td>
<td>14,20</td>
<td>15,19</td>
<td>14,78</td>
<td>15,88</td>
</tr>
<tr>
<td>2011</td>
<td>14,35</td>
<td>15,30</td>
<td>14,87</td>
<td>15,97</td>
</tr>
<tr>
<td>2012</td>
<td>14,12</td>
<td>15,28</td>
<td>14,88</td>
<td>15,86</td>
</tr>
<tr>
<td>2013</td>
<td>14,54</td>
<td>15,56</td>
<td>15,07</td>
<td>15,94</td>
</tr>
<tr>
<td>2014</td>
<td>14,89</td>
<td>15,55</td>
<td>15,16</td>
<td>15,95</td>
</tr>
<tr>
<td>2015</td>
<td>14,78</td>
<td>15,71</td>
<td>15,21</td>
<td>16,22</td>
</tr>
</tbody>
</table>

Source: Annual Industry and Service Statistics Database and Industry / Service Organizations, Research-Development (R&D) Statistics Database TURKSTAT

Table 5. Value Added Differences between Non-investors and Investors for Services Firms

<table>
<thead>
<tr>
<th>Year</th>
<th>ICT</th>
<th>Com. Soft.</th>
<th>Patent</th>
<th>R&amp;D</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>14,41</td>
<td>15,21</td>
<td>14,74</td>
<td>15,67</td>
</tr>
<tr>
<td>2010</td>
<td>13,91</td>
<td>15,01</td>
<td>14,48</td>
<td>15,22</td>
</tr>
<tr>
<td>2011</td>
<td>14,12</td>
<td>14,77</td>
<td>14,33</td>
<td>15,42</td>
</tr>
<tr>
<td>2012</td>
<td>14,18</td>
<td>14,74</td>
<td>14,28</td>
<td>15,51</td>
</tr>
<tr>
<td>2013</td>
<td>14,22</td>
<td>14,89</td>
<td>14,41</td>
<td>15,28</td>
</tr>
<tr>
<td>2014</td>
<td>14,38</td>
<td>15,00</td>
<td>14,57</td>
<td>15,25</td>
</tr>
<tr>
<td>2015</td>
<td>14,27</td>
<td>15,00</td>
<td>14,46</td>
<td>15,45</td>
</tr>
</tbody>
</table>

Source: Annual Industry and Service Statistics Database and Industry / Service Organizations, Research-Development (R&D) Statistics Database TURKSTAT

Econometric Approach

In this study, in order to find out the impact of ICT and R & D investments, which these investments accepted as technological investments of firms, on value added, we will utilize Cobb-Douglas production function which is used very commonly in economics literature (See; Mairesse and Sassenou, 1991). If we assume the production function as Cobb-Douglas production function, we can write our equation as
Q_{it} = A_{it}L_{it}^{\beta_{L}}K_{it}^{\beta_{K}} \tag{2}

In this equation, Q represents value added, A represents Hicks-netural total factor productivity, L represents the number of labor, and K represents capital stock.

In the analysis, we separated capital stock as capital stock of tangible fixed assets and capital stock of technological investments, and in order to observe the impact of technological investments separately, we separated capital stock as computer software stock, patent capital stock and R & D capital stock to evaluate separately. Moreover, we separated ICT capital stock and non-ICT capital stock in order to perform analyses separately. According to this calculation, we can write our equation as (Edquist and Henrekson, 2017b).

\[ Q_{it} = A_{it}L_{it}^{\beta_{L}}K_{Tech_{it}}^{\beta_{Tech}}K_{Non-tech_{it}}^{\beta_{Non-tech}} \tag{3} \]

When we took the napierian logarithm of third numbered equation;

\[ q_{it} = \beta_{0} + \beta_{L}l_{it} + \beta_{Tech}k_{Tech_{it}} + \beta_{Non-tech}k_{Non-tech_{it}} + \varepsilon_{it} \tag{4} \]

Baltagi (2005, s.14) indicated that when horizontal section is enormous in the panel data, he conceived that fixed effects model cause massive losses of degree of freedom. Therefore, he advocated that random effects model should be chosen in this kind of data.

In random effects model, there are personal influences in error term which changes for approached cross-section from cross-section to cross-section, and not dependant on time, that is; there are unobservable cross-section effect \( \delta_{i} \) and stochastic error effect which changes to both time and cross-section. (Baltagi, 2005, s.15; Hsiao, 2003, s.34). According to this, if we rewrote fourth equation in accordance with random effects model, we would reach below equation.

\[ q_{it} = \beta_{0} + \beta_{L}l_{it} + \beta_{Tech}k_{Tech_{it}} + \beta_{Non-tech}k_{Non-tech_{it}} + \delta_{i} + v_{it} \tag{5} \]

In the econometric models, which used industrial and firm data, there are endogeneity and selection bias problems frequently. Olley-Pakes (1996) provided us confidential predictions with semi-parametric model which he developed. With Olley-Pakes’s (1996) proposed pattern, we can rewrite production function in fourth equation:

\[ q_{it} = \beta_{0} + \beta_{L}l_{it} + \beta_{Tech}k_{Tech_{it}} + \beta_{Non-tech}k_{Non-tech_{it}} + \Omega_{it} + \eta_{it} \tag{6} \]

Error term consisted of two components in Olley-Pakes method. \( \Omega_{it} \), express productivity shock particular to firms; \( \eta_{it} \) indicates productivity shock for both firms and researchers who could not estimate it. While \( \eta_{it} \) has no impact on firm decisions, \( \Omega_{it} \) is a variable which effect the decisions of firm. (Gürel Üçdoğрук ve Kılıçaslan, 2016, s. 209). While endogeneity problem eliminated with investment which participated in function as proxy variable, selection bias
eliminated with survival probabilities. In case for semi-parametric method, it is comprised with
the series of investment and capital stock which will be included in pattern as polynomial (See;
Draca, Sadun ve Van Reenen, 2006; Taymaz ve Yılmaz, 2007; Taymaz ve Yılmaz, 2008; Tay-
maz, Voyvoda ve Yılmaz, 2008; Melitz ve Polanec, 2015; Gürel ve Kılıçaslan, 2016).

Econometric Results

Like it is mentioned before in the above, the firms’ data of manufacturing industry and service
sector, which have 20 employees and more, and contained analysis from the years of 2009-
2015, have been used in the study.

In order to calculate the impact of technological investments on value added, random effects
model has been used. Random effects model has been applied separately for both the all firms
which manufacturing industry and service sector are together in them, and the firms which
manufacturing industry and service sector are separate. Because R&D investments are project
investments and the perception of these investments take time to turn into products and in-
crease in value in the market, the models have been analyzed with the inclusion of the lagged
values of R & D investments. In the result of analysis, both capital and labor coefficients ap-
peared in significant theoretical limits statistically. The impact of ICT and Non-ICT capitals
on value added is positive and significant in every three-sample level (See: Table 6; All-Manu-
facturing-Services; Model 2).

In the models of computer software, patent and R & D capitals which evaluated together, the
impact of variables on value added is positive and significant except patent capital. (See: Table
6; All-Manufacturing-Services; Model 3). In the model which evaluated R & D capital as one
year lagged, the coefficient of all variables is positive and significant in the observations except
the observations of the service sector firms (See: Table 6; All-Manufacturing-Services; Model
4). In the model which evaluated R & D capital as two years lagged, while the patent capital
of service sector is insignificant, it can be seen that the impact of other variables coefficient is
positive and significant. (See: Table 6; All-Manufacturing-Services; Model 5).

As a result, while the elasticity of ICT capital is found approximately as between 0.10 and
0.12, the elasticity of computer software capital is found approximately as 0.05, the elasticity
of patent capital is found as approximately 0.03, and the elasticity of R & D capital (two years
lagged) is found as approximately 0.05. The estimation results of random effect are showing
that there is a significant relationship between technological investments and value added sta-
tistically positive.

In this study, we use Olley-Pakes method, which we assume that it will eliminate endogene-
ity and selection bias problems, in order to determine ICT investments, R & D investments
and value added. Olley-Pakes method has been applied separately for both the all firms which
manufacturing industry and service sector are together in them, and the firms which manufac-
turing industry and service sector are separate.
Table 6. Effect of Technology Investments on Firms' Value Added: Random Effects Estimation Method, Dependent Variable: Value Added

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Manufacturing</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2) (3) (4) (5)</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>Capital</td>
<td>0.203***</td>
<td>0.220***</td>
<td>0.172***</td>
</tr>
<tr>
<td></td>
<td>(0.00581)</td>
<td>(0.00648)</td>
<td>(0.0127)</td>
</tr>
<tr>
<td>Labor</td>
<td>0.890***</td>
<td>0.904***</td>
<td>0.840***</td>
</tr>
<tr>
<td></td>
<td>(0.00989)</td>
<td>(0.00984)</td>
<td>(0.0125)</td>
</tr>
<tr>
<td>ICT capital</td>
<td>0.110***</td>
<td>0.119***</td>
<td>0.103***</td>
</tr>
<tr>
<td></td>
<td>(0.00945)</td>
<td>(0.0105)</td>
<td>(0.0210)</td>
</tr>
<tr>
<td>Non-ICT capital</td>
<td>0.0933***</td>
<td>0.103***</td>
<td>0.0664***</td>
</tr>
<tr>
<td></td>
<td>(0.00933)</td>
<td>(0.0103)</td>
<td>(0.0216)</td>
</tr>
<tr>
<td>Tangible capital</td>
<td>0.147***</td>
<td>0.156***</td>
<td>0.126***</td>
</tr>
<tr>
<td></td>
<td>(0.00802)</td>
<td>(0.00943)</td>
<td>(0.0104)</td>
</tr>
<tr>
<td>Com. soft. capital</td>
<td>0.0254***</td>
<td>0.0458***</td>
<td>0.0365***</td>
</tr>
<tr>
<td></td>
<td>(0.00475)</td>
<td>(0.00497)</td>
<td>(0.00568)</td>
</tr>
<tr>
<td>Patent capital</td>
<td>-0.00291</td>
<td>0.0246***</td>
<td>0.0295***</td>
</tr>
<tr>
<td></td>
<td>(0.00821)</td>
<td>(0.00548)</td>
<td>(0.00600)</td>
</tr>
<tr>
<td>R&amp;D capital</td>
<td>0.0248***</td>
<td>0.0195*</td>
<td>0.0355*</td>
</tr>
<tr>
<td></td>
<td>(0.00902)</td>
<td>(0.0102)</td>
<td>(0.0192)</td>
</tr>
<tr>
<td>R&amp;D capital₁</td>
<td>0.0164***</td>
<td>0.0173***</td>
<td>0.00248</td>
</tr>
<tr>
<td></td>
<td>(0.00592)</td>
<td>(0.00649)</td>
<td>(0.0140)</td>
</tr>
<tr>
<td>R&amp;D capital₂</td>
<td>0.0453***</td>
<td>0.0501***</td>
<td>0.0294*</td>
</tr>
<tr>
<td></td>
<td>(0.00644)</td>
<td>(0.00649)</td>
<td>(0.0153)</td>
</tr>
<tr>
<td>Constant</td>
<td>7.442***</td>
<td>7.631***</td>
<td>7.733***</td>
</tr>
<tr>
<td></td>
<td>(0.0761)</td>
<td>(0.0728)</td>
<td>(0.0720)</td>
</tr>
<tr>
<td>Wald Test</td>
<td>21594***</td>
<td>21518***</td>
<td>21251***</td>
</tr>
<tr>
<td></td>
<td>(0.0176)</td>
<td>(0.0176)</td>
<td>(0.0176)</td>
</tr>
<tr>
<td>R²</td>
<td>0.831</td>
<td>0.830</td>
<td>0.828</td>
</tr>
<tr>
<td></td>
<td>0.848</td>
<td>0.850</td>
<td>0.854</td>
</tr>
<tr>
<td>Observations</td>
<td>11661</td>
<td>11661</td>
<td>11661</td>
</tr>
<tr>
<td>Number of id</td>
<td>3959</td>
<td>3959</td>
<td>3959</td>
</tr>
</tbody>
</table>

All variables are log-transformed

Source: Annual Industry and Service Statistics Database and Industry / Service Organizations Research-Development (R&D) Statistics Database TURKSTAT

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
**Table 7. Effect of Technology Investments on Firms’ Value Added: Olley and Pakes (1996)**

*Estimation Method, Dependent Variable: Value Added*

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Manufacturing</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Capital</td>
<td>0.298***</td>
<td>(0.0300)</td>
<td>0.336***</td>
</tr>
<tr>
<td>Labor</td>
<td>0.685***</td>
<td>(0.0165)</td>
<td>0.645***</td>
</tr>
<tr>
<td>ICT capital</td>
<td>0.147***</td>
<td>(0.0153)</td>
<td>1.65***</td>
</tr>
<tr>
<td>Non-ICT capital</td>
<td>0.156***</td>
<td>(0.0210)</td>
<td>0.182***</td>
</tr>
<tr>
<td>Tangible capital</td>
<td>0.144***</td>
<td>(0.0183)</td>
<td>0.0921***</td>
</tr>
<tr>
<td>Com.soft. capital</td>
<td>0.0675***</td>
<td>(0.00393)</td>
<td>0.0812***</td>
</tr>
<tr>
<td>Patent capital</td>
<td>-0.0224***</td>
<td>(0.00122)</td>
<td>0.0390***</td>
</tr>
<tr>
<td>R&amp;D capital</td>
<td>0.0609***</td>
<td>(0.0127)</td>
<td>0.0478***</td>
</tr>
<tr>
<td>R&amp;D capital&lt;sub&gt;1&lt;/sub&gt;</td>
<td>0.0345***</td>
<td>(0.00965)</td>
<td>0.0357***</td>
</tr>
<tr>
<td>R&amp;D capital&lt;sub&gt;2&lt;/sub&gt;</td>
<td>0.0526***</td>
<td>(0.00539)</td>
<td>0.0636***</td>
</tr>
</tbody>
</table>

Observations: 11643 11643 11643 11642 11642 9050 9050 9049 2593 2593 2593 2593 2593 2593

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
All variables are log-transformed and all regressions include constant and time dummies.

*Source: Annual Industry and Service Statistics Database and Industry / Service Organizations Research-Development (R&D) Statistics Database TURKSTAT*
Because R&D investments are project investments and the perception of these investments take time to turn into products and increase in value in the market, the models have been analyzed with the inclusion of the lagged values of R & D investments. The coefficients of capital and labor are significant for all models statistically as a result of analysis. The impact of ICT and Non-ICT capitals on value added is positive and significant in every three-sample level (See: Table 7; All-Manufacturing-Services; Model 2). In the models of computer software, patent and R & D capitals which evaluated together, the impact of all variables on value added is positive and significant except patent capital (See: Table 7; All-Manufacturing-Services; Model 3). In the model which evaluated R & D capital as one year lagged, the coefficient of all variables in the observations is positive and significant except the observations of the service sector firms (See: Table 7; All-Manufacturing-Services; Model 4). In the model which evaluated R & D capital as two years lagged, while the patent capital and the real capital of service sector are insignificant, it can be seen that the impact of other variables coefficient is positive and significant. (See: Table 7; All-Manufacturing-Services; Model 5).

As a result, while the elasticity of ICT capital is found approximately as between 0.15, the elasticity of computer software capital is found approximately as 0.08, the elasticity of patent capital is found as approximately 0.04, and the elasticity of R & D capital (two years lagged) is found as approximately 0.05. To sum up, there is a significant and statistically positive relationship between technological investments and value added in the estimation results of Olley-Pakes method as well.

**Conclusion**

The impact of ICT and R & D investments, which those investments regarded as technological investments in manufacturing industry and service sector in Turkey, on value added has been analyzed in this study. The impact of ICT and R & D investments on value added and productivity began to be researched in the economics literature since 1990s. However, either ICT investments or R & D investments analyzed only in these studies, and the studies which analyzed both together are quite less. Moreover, there is no such study, which aimed to research this impact for Turkey. Therefore, it is quite important to reveal the impacts of technological investments in the manufacturing industry and service sector on value added in Turkey.

When it is observed generally, it can be seen that ICT investments are extensively above than %50 in both manufacturing industry and service sector. In a similar manner, R & D investments are also extensively above than %50 in these sectors. In case of patent and computer software, they are around %30 percent in these sectors.

Average value added of firms in manufacturing and service sector (in terms of logarithm) that invest in technology as ICT, computer software, patent, R&D are considerably higher than that of non-investors.
Two different econometric analyses have been used from the data of 2009-2015 in order to research the relationship between the technological investments and value added in Turkish manufacturing industry and service sectors. The obtained results from both random effect model and Olley-Pakes method indicates that there is a positive and statistically significant relationship between the technological investments and value added of Turkish manufacturing industry and in partial service sectors. The relationship between technological investments and value added for service sector could not be revealed clearly because the number of observations are not enough to determine properly.

Nowadays, the investment of technology became a necessity for firms in order to survive in current competitive conditions. However, these investments cause a cost increase rapidly and many firms have drawbacks about these investments. For this reason, it is important that technological investments should be supported and encouraged by the state. There are encouragements about R & D from Turkish Science, Industry, and Technology Ministry. Same encouragements to other technological items will affect productivity and economic growth positively if they will be given by Turkish Science, Industry, and Technology ministry.
THE IMPACT OF TECHNOLOGY INVESTMENT ON VALUE ADDED: AN EMPIRICAL STUDY ON TURKISH MANUFACTURING AND SERVICE SECTOR

Gül GÜNEY

References


PART V.

CHAP 5.

RETHINKING ON FOOD PRICE SPECULATION IN TERMS OF GLOBAL FINANCIAL CRISIS

Bilgen TAŞDOĞAN*, Celal TAŞDOĞAN**

Introduction

Agricultural production is characterized by unpredictable harvest periods, thus agricultural prices are unstable in which compared to other goods. Therefore, the possible risks on price cause a danger for producers and industrial processors who need for the market to transfer risks to the speculators (Kerckhoffs, Van Os, Vander Stichele; 2010, p. 2). The speculators make price agreement contracts based on the expected value of the goods at the future when the contract’s value is above spot market price the market has an extra premium or vice versa. Actually, speculation requires buying goods in potential selling price rather than its spot market price. It is identified that there are four types of speculation; natural independent hedging, market hedging, natural independent speculation, and market speculation.

Natural independent hedging; this form is to take a financial position as protection for the risk of the unpredictable cases, which are adverse weather conditions influencing harvest efficiency. In other words, natural independent hedging is the type of insurance. Market hedging; this form is the taking of position against adverse market movements like an exchange rate volatility which has the potential to influence price volatility. Hereby, this type of hedging has a positive impact on the real economic activity. Natural independent speculation; it is the trading of the contracts in the natural independent hedging market. Unfortunately, it serves no useful purpose for economic activity. Such an activity increase liquidity in the markets where risks are hedged. Market speculation; the final form of the speculation defines pure speculation matter. The motivation of this form is to profit from market movements rather than real economic activity. Therefore, it is accepted that while this form provides liquidity and reduces hedging costs it can also have negative impacts in terms of the potential volatility on prices and increase the hedged market risk (Spratt, 2013, pp. 7-8).

* PhD, Aksaray University,
** Corresponding Author, Assoc. Prof, Ankara Hacı Bayram Veli University ctasdogan@gazi.edu.tr
It is widely accepted that financial speculation is the main factor behind the dramatic price movement of many commodities, especially agricultural products, in the period of 2007-2009 (Unctad, 2009; Wahl, 2009). However, for the period of mid-2007 and mid-2008, many economist, bankers, financial market consultant and even policy makers said that the price movement of agricultural products depended on the supply and demand conditions rather than market speculation of financial investor desired to profit from changing prices, even though grain production in 2008 reached a record globally. It is certainly acceptable that increasing cost of cultivation affected by high oil prices, insufficient agricultural support policy dropped yields, adverse weather conditions in some countries were imbalances that could explain some of the price increase, Nevertheless, the sharp increase of the grain prices in very short time was hard to explain without taking into account speculation matter.

The most common argument in terms of speculation is simply that speculators require activities to be stabilizing rather than destabilizing. The function of speculator estimates the future market position and reduces the volatility. Basically, speculators are supposed to buy when prices are low and sell when prices are high. Speculators play an important role in future markets for commodities, they hedge prices against changes influenced producers and consumers. In other words, it is not worried about the presence of speculation in agricultural markets. This argument also neglects adjustments by the government. Even though this argument widely accepted, the sharp increases of primary commodities in the period of 2007 and 2008 cannot be explained by short-time supply and demand factors or any other real economy tendencies. Instead of this price movements are clearly seen by the result of speculative activities in future markets (Ghosh, 2010, pp, 74-77). Even there is no evident reason to think speculation for such movements, supply and demand factors are not enough to think the dramatic movement of prices.

**Causes of Food Price Volatility**

The “agflation” concept was created in 2008 saw the doubling of maize and wheat prices rising by 50 percent, and rice increasing about 70 percent. This conjuncture is associated with the rising of energy and food demand due to high oil price. In addition, a rising of new consumers is in middle-income countries where people have a new diet because of the expansion of spending capacity in purchasing power parity. In these countries, car ownership and meat consumption became the symbols raised demand for agrofuels and feed crops. Simultaneously, financial speculation was let to another problem claimed by The New York Times, April 22, 2008, reported that the food price boom has attracted new investment from Wall Street, estimated about 130 billion US dollars captured a half of the future contracts for commodities like corn, wheat, and live cattle on Chicago, Kansas City and New York stock exchanges (Mc-Michael, 2009, pp 32-33).
The most popular argument affected the food price increases in developing countries is the low-income groups within the population in whom the urban and rural poor depend on the market to access food products. These people spend an important proportion of their incomes on food expenditures. Therefore, the food price increases created a challenge for the ability of the poor household to meet the basic food needs (Unctad, 2008). As seen in Chart 1 the food prices index finally declines after the sharp increases. While the price of major agricultural products has fallen from their peak levels, they still remain high compared to previous years. As far as we can see that the food prices volatility were not the temporary case and it can be said that prices for the most food products are likely above 2000 levels through 2017.

This situation is also unpredictable because price increases for all food commodities have been simultaneously associated with record high prices for energy products. It is claimed that high food price seems to have a stronger link with high energy prices. The food commodity prices have risen 98 percent in 2008, the index for all commodities has risen 286 percent and the index for crude oil has risen 547 percent (Trostle, 2008, p. 3).
It is seen in Chart 2 that when food prices started to rise in late 2005, sugar price rose first and most sharply, followed by oils and dairy in 2006 and cereals in 2007. Finally, all food prices have sharply risen in 2008. This dramatical movement of food prices except sugar have even fallen down in 2009, all prices were above before 2005 levels.

The FAO pointed out that the consumers in developing countries were losers in the food price volatility, and also producers did not profit from high prices due to higher input prices. Therefore, the supply response of the producer is strictly limited by high-cost fertilizer and energy prices. Additionally, the financial crisis is bound to take over this situation with the availability of credit (Piesse and Thirtle 2009, pp.127-128).

It is well known that several factors contributed to food price volatility, “includes supply and demand factors and also short and long time reasons. A number of long term trends, as well as short term factors, have slowed down output growth causing increase the agricultural product prices. It was estimated that the growth rate of grain production will decline about 1.2 per cent per year between 2009 and 2017” (Trostle, 2008, p.4). “Many factors have contributed to the slowing of growth, these include the reduction of state intervention in the agricultural sectors of developing countries; reduced public support and overall investment in agriculture; and a decline in research and development by governmental and international institutions. The decrease in growth has also been impacted
by resource scarcity issues, especially climate change and water depletion, floods, and freezing weather due to climate change. Furthermore, there is a general sense of the reduced need for individual countries to hold public grain reserves as agricultural markets have become increasingly liberalized. The private sector and international financial institutions have maintained that holding public stocks is costly and inefficient; the rise of “just-in-time” inventory management and years of readily available global supplies were further incentives to reduce stock holdings.

In addition, the declining growth rate has related to the decline in global stocks. The FAO calculates world cereal stocks have fallen to 405 million tons which are the lowest level since 1982 by the end of 2008 and also world wheat stocks dropped to 147 million tons, the lowest level since 1977 in the USA. That’s why a reduction in exports from main exporting countries to cover the global shortfall and encouraged the speculation in recent years” (Mittal, 2009, p.4-5). In other words, the stock to utilization ratio is the key variable when it is low it can be expected upward volatility and speculators take a position (Piesse and Thirtle, 2009, p. 121). Furthermore, higher temperatures in the tropics and more variability may result in poorer harvest, e.g. agricultural production reduced by over 25 percent in tropical countries, the droughts similarly are the factors in the scarcity of water irrigation (Mitchell, 2008, p.7). Another reason is production cost, doubling of prices of energy intensive production, including fertilizer and fuel. This rise in the cost of production increased the export prices of the main food commodities by about 15-20 per cent between 2002 and 2007 (Mitchell, 2008, p.6). Rapid income growth in developing countries like China and India has contributed to increased oilseed demand and oilseed prices. Both China and India have been net grain exporters since 2000, although exports have decreased (Mitchell, 2008, p.14). It seems that consumption in China and India reached for over a third of the world’s population and in where economies grew at 11,4 per cent and 9,2 per cent in 2007, respectively. Demand for food is income inelastic that’s why the demand for food does not vary importantly with the growth of people income, even though the composition of food basket changes more from the traditional foods to higher quality e.g. meat (Mittal, 2009, p.5).

Despite all this approach, “many studies define biofuels production as a major driver for high food prices. The USDA’s chief economist before Joint Economic Committee of Congress pointed to biofuel production for the much of increase in farm prices of maize and soybeans. The IMF estimated that the increasing demand for biofuels accounted for 70 percent of the increase in maize prices and 40 per cent of the increase in soybean prices. Increased biofuel production has risen the demand for food commodities. The use of maize for ethanol grew rapidly from 2004 to 2007 and used 70 per cent of the increase in global maize production. Nevertheless, feed use of maize grew by only 1,5 percent per year from 2004 to 2007 while ethanol use grew by 36 per cent per year. The share of global feed use declined in response to maize prices from 69 to 64 percent in the same period. The US is the largest producer of ethanol from maize and used about 81 million tons for ethanol in the 2007/08 harvest year. Canada, China, and EU used an additional 5 million tons of maize for...
RETHINKING ON FOOD PRICE SPECULATION IN TERMS OF GLOBAL FINANCIAL CRISIS

Bilgen TAŞDOĞAN, Celal TAŞDOĞAN

ethanol. Sum of all used maize for ethanol to 86 million tons, about 11 percent of global maize production” (Mitchell, 2008, pp. 5-7).

The World Bank’s 2008 World Development Report pointed out that agricultural growth has been about four times more effective in raising the incomes of extremely poor people than outside the sector. However, underinvestment in agriculture by the national governments has prevented the poorest developing countries from developing by farm sectors. Thus, it has been eroded their ability to grow agricultural production that’s why increasing the dependency on imported food. When the World Bank promoted to support of a variety of agricultural marketing in the 1970s, in 1980s and 1990s, it strongly encouraged the withdrawal of the government roles e.g. eliminating agricultural marketing boards which managed the stock of food at the national level and bought agricultural commodities from farmers at fixed prices. “Marketing boards also organized the redistribution of food from surplus to deficit areas of the country. By preventing price volatility, protected both producers and consumers against sharp rises or drops in prices, prioritized self-sufficiency, and thus reduced the need for food imports and for foreign exchange earnings to pay for them. After over two decades of economic liberalization and related reforms, however, the recent food crisis and the vulnerability of food insecure developing countries have shown that food markets intervention still remain. Alternative way stabilizing the prices of agricultural production for farmers is future contracts which have fixed quantities, prices and delivery dates and also speculators are supposed to buy when prices are low and sell when prices are high thus it is assumed that prices may be less volatile without government intervention” (Mittal, 2009, pp. 6-11).

The Role of Speculation on Food Price Volatilities

Surely, supply and demand shocks played important role in the food price crisis of 2007 and 2008. However, the arguments of supply and demand conditions are unsatisfactory to explain the volatility in details. E.g. the price of rice increased by 165 percent between April 2007 and April 2008, even though rice stocks was not low. It was not explained that dairy product’s prices reached by 157 percent more because of that a group of people changed the taste for consuming huge quantities of dairy products between 2006 and November 2007. In addition, it is difficult to accept the food price increases were the result of per capita income growth in China and India and other emerging countries. Instead of these arguments, a number of signs indicate that a significant portion of the price bubble was because of speculation matter. The 2008 food price crisis was that it was possibly the first price crisis occurred in commodity derivate markets. Just before the bankruptcy of Lehman Brothers the volume of the index fund speculation increased by 1.900 percent between 2003 and 2008, Morgan Stanley estimated that the number of outstanding contracts in maize futures reached from 500 000 in 2003 to 2,5 million in 2008. The commodity index fund bubble had risen from 13 billion US dollars in 2003 to 317 billion US dollars in 2008. In the light, these changes, the UNCTAD Trade and
Development Report 2009 pointed out that the greater financialization of commodity led to the relative size of price changes unrelated to market fundamentals. Meant that changes in food prices were not the movements of supply and demand conditions, it is obviously seen that a significant speculation affected price volatility (Schutter, 2010, p.3).

It has got clear more and more since the decrease in food prices after 2008 at the latest, which neither increasing demand in the emerging countries like China and India, biofuel production created the food prices upward trend nor short term factors such as poor harvest play a role. Moreover, speculation is the obvious factor for price volatility in related to the financial crisis. The crisis in the mortgage sector in US due to the result of a huge speculative bubble disseminated the whole financial system then speculators have seen alternatives in the commodity sector, thus the bubble started from this conditions. The Commodity Futures Trading Commission pointed that the commodity markets set the price of commodities as an asset instead of setting the price based on the factors of supply and demand. Therefore, they have resulted in price distortion even the bubble (Wahl, 2009, pp, 7-8).

Changes in supply and demand fundamentals cannot fully explain the recent movement in food prices. Rising expectations and speculation also must be taken account for the volatility of food prices. The flow of speculative capital from financial investors to the agricultural commodity markets in that the number of futures contracts has increased over time, therefore the volume of traded grain future contracts increased significantly from May 2007 to May 2008 (Robles et al, 2009, p.2). Similarly Agricultural and Food Policy Center informed that the huge flow of money into markets in long position has pushed commodity prices to extremely high levels (Sanders and Irwin, 2010, p. 26).

Robles et al, (2009) analyzed the role of financial speculation in agricultural prices focused on trading activities in agricultural commodity futures markets based on the information from the Chicago Board of Trade (CBOT) which is the agricultural futures exchanges. The analysis limits on four major commodities: maize, wheat, soybeans, and rice to identify the size of change speculative behavior in agricultural commodity markets. For this purpose, the study analyzes four indicators: volume of future contracts, open interest in futures contracts, the ratio of volume to open interest in futures contracts and positions in future contracts by noncommercial traders. The monthly volume of futures contracts consists the total number of trades in commodity futures contracts in the CBOT on monthly basis. The data show that the traded volumes have increased significantly in recent years. A reason for this increase in volumes may be more participation of short-term speculators in these markets. Monthly open interest in futures contracts captures the total number of futures contracts for any commodity in that it generates an open position until taking the opposite position or the contracts expires. This data shows that open interest had grown over the past five years. Meant that the entry of medium or long term speculators played an important role in the food price crisis. The ratio of volume
to open interest in futures contracts captures speculative market activity under the supposed conditions that majority of speculators chooses to get in and out of the market in a short time rather than futures traders not to engage in speculation. Therefore, the changes in this ratio had shown speculative activity. Futures positions in a commodity are classified by Commodity Futures Trade Commission as commercial in which a trader uses futures contracts for hedging purposes otherwise a position is classified noncommercial and noncommercial positions in futures contracts represent for speculative activity. The ratio of noncommercial positions to total positions in futures contracts. Finally, the ratio of long noncommercial positions to total long positions had grown in recent years.

On the other hand, the commodity index funds are important indicators. These funds speculate on a basket of up to or more commodities which consist of agricultural commodities usually account for 10 or 20 percent of the index. Index fund speculation is no longer related to the basis of the food markets, they follow the trends of stock exchange indices. The speculation behavior of the funds is pro-cyclic because of that low transaction costs are created (Wahl, 2009, p. 11). The commodity index funds are known as commodity mutual funds and preferred by hedge fund companies. They invest money in the commodities listed then when they are sold all commodities are sold at the same time. The value of fund is evaluated at the end of the day based on each commodity’s closing price. Some index funds are invested in the future markets, others replicate price movements synthetically with commodity swaps from investment banks. On the other hand, large-scale index fund investment in the futures markets consist of a different type of risk. Whether short or long positions, index funds are invested in physical commodities in that it distorts commodities from their real use or invested in futures in where it distorts the relation between spot and future prices (Lines, 2010, pp.7-9).

With the mortgage crisis, speculative business in the financial sector met difficult conditions then the institutional investors looked for new markets. Finally, they entered the commodity markets even agricultural commodities. E.g. the Deutsche Bank fund has invested in food speculation, the futures were bought the expectation of increasing prices and then sold later at a profitable level. When institutional investors preferred to the commodity markets, the price trend of contracts affected. Therefore, as the futures prices increased commodity market traders and index funds dealt with commodity derivatives and even hedge funds and other institutional investors seeks high yields. For several reasons, the effect of speculation on price increase is impossible to determine because of that statistics do not distinguish between traders and speculators, hedge funds run in a completely non-transparent way and generally located in offshore centers and tax havens without supervision and so on. Even though the US senate that the large extent of speculation on the markets has importantly let the price increase (Wahl, 2009, pp. 12-14).
Conclusion

It is widely accepted that speculative buying by index funds in commodity futures resulting in derivatives markets created a bubble in commodity prices and also crude oil prices, in particular, the fundamentals of supply and demand factors in the markets. As mentioned above, institutional investors and index fund speculators had a great impact in commodity markets. They were not sensitive to prices of commodities that’s why multiplied their impact on commodity markets. They trade in the commodities futures market without concerning with the price per unit. Therefore, they buy futures contracts as they need at whatever price as necessary for their profit and cause a great effect in commodities markets by increasing commodities prices artificially. Even though they are not the exact determinants for such an increase in commodities prices. They have had their own influence accounted to a great extent for the bubble of commodities prices increases. Attempting to explain commodity price movements have been put on the market for the last 30 years. From commodity overview, main determinants of the commodities price changes include US dollar depreciation, demand and supply for commodities in the market, the participation of institutional investors in commodities futures markets and additionally regarding with bubble creation by giving the impact of commodity index speculators. It can be explained that the sharp increases in commodity prices during the 2006-2008 period by considering the bubble effect in the commodity futures market created by institutional investor and participation of index speculators.

The extreme food price volatility had been thought in period of 2007-2008 that millions of people were into a situation of food insecurity. At the same time the less economist have focused on regulation of financial markets. However, authorities have moved tighten regulations over agricultural commodities futures markets. Meant that it is accepted volatility in these markets contributed to the crisis. Scholars of international political economy have neglected the regulation for the crisis that’s why the politics of the global food system have paid little attention to financial markets even global financial experts have tended to ignore food price movements (Clapp and Helleiner, 2012, pp. 181-182). This issue have a gap for futures contracts prices considered global financial crisis cases. Food issues may be the top concerning for economists near future.
RETHINKING ON FOOD PRICE SPECULATION IN TERMS OF GLOBAL FINANCIAL CRISIS

Bilgen TAŞDOĞAN, Celal TAŞDOĞAN

References


Schutter, O.D., (2010), Food Commodity Speculation and Food Price Crisis, Briefing Note, 02, September, UN.


464
PART V.
CHAP 6.

SMALL AND MEDIUM-SIZED ENTERPRISE COLLABORATION WITH SUPPLIERS FOR INNOVATION

Mustafa İncekara*

Introduction

The experience of small- and medium-sized enterprises (SMEs) regarding supply chain management differs significantly from that of larger companies (Quayle, 2003). An important factor is the lower emphasis of SMEs on innovation in a supplier context (Quayle 2003; Wagner et al., 2003). Due to financial limitations, lack of structural resources, and higher anxiety around failure, SMEs have higher uncertainty than large firms. Therefore, their attitude towards the idea of integrated supply chain management also differs from that of larger enterprises (Chen et al., 2003, 2004). In addition, SMEs are under high pressure from competing larger firms in the market who are increasing their market share by optimizing supply abilities, meeting customer demand, and have a faster development process for new products (Gelinas and Bigras 2004).

Existing research didn’t concentrate on the causes that can really help these SMEs in involving suppliers. Ale Ebrahim et al. (2009) focused on some strengths of SMEs, like their structural adaptability, better flexibility when facing market alterations, setting that facilitates learning, dynamic approach, and customer-focused business models. These assets play a vigorous role in SMEs adoption of suppliers. Customer behaviour is especially central to the corporate operation of SMEs, as their customer base is typically small. With increasing variation in customer demands and higher demand for customizable products, SMEs are expected to make better use of supplier integration in the product development process.

Lack of financial resources can also have been seen as an issue that inspires SMEs to involve suppliers (Hughes et al., 2003; Wagner et al., 2003). With lack of resources, the advancement of SMEs is highly reliant on creating good relationships with suppliers (Morrisey & Pittaway, 2006). They can improve their limited know-how and resources by building better relationships with suppliers who can help them gain knowledge of and access to new technology (Koh et al., 2007). Healthier supplier relationships can also help companies in mitigating the risk of product scarcity since these companies generally have restricted inventory structure (Jones,

* Pamukkale University, The Faculty of Economics and Administrative Sciences, 20160 Denizli, Turkey, mincekara@pau.edu.tr
SMALL AND MEDIUM-SIZED ENTERPRISE COLLABORATION WITH SUPPLIERS FOR INNOVATION
Mustafa İncekara

1996). As Udomleartpresert et. al. (2003) pointed out, for SMEs, supplier cooperation is not dependent on partnership, but on reliance.

Collaboration between SMEs and their suppliers is important in achieving the innovation objectives. Several factors influence the successful involvement of suppliers into SMEs’ innovation processes. This article focuses on the factors which affect cooperation between SMEs and suppliers.

Research Model

This paper presents a supplier integration model in product development activities conducted by SMEs. Several variables can influence the intensity of supplier–SME cooperation and therefore the outcome of the product innovation. Better knowledge of the relationships between SMEs and suppliers could increase executives’ awareness of inter-organizational cooperation in new product development efforts. Figure 1 suggests several relationships that affect supplier integration in product development that must be assessed to answer the following research questions: First, which determinants determine the intensity of involvement between an SME and supplier; second, how can the involvement of the supplier into the SME’s product development processes be designed to achieve a positive result?

![Figure 1: Conceptual Model](image)

**SME–supplier dependency and supplier intensity**

SME–supplier dependency is the mutual dependency of a SME and its supplying business partner. If the SME is highly dependent on the supplier, this implies difficulties in carrying out a substitution of the supplier. Conversely, the supplier is also faced with the situation of offering his product to a different company. This may be difficult or even impossible in the case
of specific products and specific companies, leading to mutual dependency between SME and suppliers (Durst, 2011).

These mutual dependencies play a role in the investigation of supplier involvement in SMEs’ innovation activities. The success of each business partner can be expressed inversely in proportion to its dependency ratio. At the same time, it can be shown that cooperative behaviour of business partners is promoted by high interdependence (Lusch & Brown, 1996).

This interdependence between the SME and the supplier is meaningful, since a one-sided dependency can lead to doubts about long-term willingness to cooperate with the supplier. In addition, there are concerns about the attractiveness of the business relationship for unilateral dependencies. The stronger the interdependencies, the more guidelines and agreements are made and adhered to (Schulte-Zurhausen, 2010), and therefore the supplier integration intensity is higher. Thus, the following hypothesis is proposed:

\textit{Hypothesis 1:}

Greater mutual dependency leads to a higher extent of supplier intensity.

\textbf{Supplier–SME experience and supplier intensity}

Existing experiences with a potential supplier can facilitate the integration of this supplier into the product innovation phase during product development. Since most companies rely on existing vendors, experience-based information is frequently available about the development partner (Large, 2009).

Cooperation is typically based on the confidence built between the parties. The trust between the partners potentially serves to reduce transaction costs (Dyer & Chu, 2003; Rink, 2008) because the experience gained in previous transactions can be built upon (Matthes, 2007). Through the cooperation, both actors develop an understanding of the corporate culture, the management systems, the skills, and also the weaknesses of the cooperating partner (Zollo et al., 2002).

The informal protection mechanism of trust is superior to contractual agreements, as it results from the increase in confidence of the partners over a longer period of working together (Rink, 2008). Customers choose to continue to receive their services from well-known suppliers because they learn from experience that the supplier’s services meet their needs, since the information asymmetry of the customer is reduced. Thus, the quality risk is reduced by building long-term business relationships with suppliers (Ozga, 2010).

In addition, an increased learning effect may be derived from the experience with an already known supplier, since the knowledge of the parties will lead to cooperative behaviour (Ozga, 2010). Thus, the following hypothesis can be stated:
Hypothesis 2: More extensive SME experience with the supplier is related to a greater intensity of supplier integration

Product importance and supplier intensity

The desired goals of an SME are tightly related to the attributes of the product provided by the supplier, and therefore the supplier’s competences, when it comes to innovation and production (Müller, 2004). In addition, the part supplied plays a significant role in obtaining preferred objectives in quality, reputation, or distinguishing factors, particularly as designed by the customer through its use in development of a brand-new device (Müller, 2004). Essentially, a product’s importance for the SME determines the level to which the business’ obtaining and offering connected to the supply results in meeting its goals (Babtista, 2014).

The importance of a bought entity is determined by the level of fulfilment achieved by the firm when it meets its formulated goals by applying the product (Metcalf et al., 1992). The customer determines the criticality of an object regarding monetary indicators, value and scope, quantity, as well as an evaluation of the goals meant to be met by purchasing the entity. Furthermore, there is an immediate attachment between the product relevance and the strength of the information flow between customer and supplier (Metcalf & Frear, 1993). This presence of relational bonds creates a much more collaborative SME–supplier partnership. The better these connections, the more the customer will look at the importance of obtaining the item (Müller, 2004). This positive association increases considerably with the importance of the product to the SME. This leads to the following hypothesis:

Hypothesis 3: Higher product importance is related to a greater intensity of supplier integration

Impact of supplier integration on the outcome of innovation projects

The object of this work is the impact of supplier integration in the innovation process on the success of innovation projects. By integrating suppliers into the product development process by distributing development tasks, companies can increase their flexibility and thus reduce risks. (Bidault et al.; Clark & Fujimoto, 1991; Nishiguchi, 1994), as well as speed development (Clark, 1989; Gupta & Souder, 1998). The resulting market entry is a significant reduction in market risks. In addition, vertical cooperation has a positive impression on the cost and quality of product innovation (Dyer, 1997; Kessler, 2000; McGinnis & Vallopra, 1999). Innovations have the prospective to examine the value of present resources and existing buyer-supplier relationships (Arnold et. al. 2010). In cases with high technological uncertainty, the onus is increasingly on the supplier to provide the customer with knowledge of the technology. By means of supplier cooperation it is possible to access the latest technology from suppliers; this increases the scope for the customer’s work, and increases flexibility (Berkenhagen & Vrbica,
The integration of suppliers is thus critical to achieve goals in the development of innovative technologies (Ragatz et al., 2002). However, higher requirements for a supplier also lead to the need to intensify cooperation with this supplier. In this situation, the significance of relationships with established suppliers is limited (Primo & Amundson, 2002). In addition, supplier performance plays a role in the fulfilment of the differentiation characteristics desired by the customer. (Müller, 2004).

The supplier thus contributes to the process-related and the output-related characteristics of innovation outcome. Based on these conclusions, it can be determined that an intensive cooperation between the customer and the supplier in the product innovation activities has a positive effect on the success of supplier integration, which in turn has a positive influence on the overall development. Therefore, the following hypotheses can be formulated:

Hypothesis 4:
Greater supplier intensity leads to greater process-related innovation success for SMEs.

Hypothesis 5:
Higher supplier intensity leads to more output-related innovation success for SMEs.

Methodology

Quantitative data regarding supplier involvement in product innovation by SMEs were collected from an online questionnaire sent to participants with relations to suppliers and activity in product development. The survey contained Likert-scale questions (1–7). After finishing data gathering, we obtained 54 valid responses. Analyses were conducted by applying a partial least-squares structural model.

Measurement model evaluation

This study used a structural equation model, specifically the PLS-SEM method, to examine the proposed hypotheses. This method measures variables and structural paths simultaneously. The measurement model was judged based on various validity and reliability tests. Cronbach’s alpha was applied as a reliability test. These indicators were between 0.618 and 0.899, and therefore all above the limit of 0.5 (Table 1). For convergent validity we used three measures: The factor loadings of the items of the variables should be over 0.5 (Hair, 1999); composite reliability (CR) should be above 0.6 (Bagozzi & Yi, 1988); and the average variance extracted (AVE) of each variable should be more than 0.5 (Fornell & Larcker, 1981). The model evaluation outputs reveal that the factor loadings for each item exceeded 0.5. The variety for composite reliability was from 0.804 to 0.915, and the AVE ranged from 0.525 to 0.700. The square roots of
AVE exceeded the related correlations (Table 2); therefore, discriminant validity for each variable meet the acceptable level of 0.5.

Table 1: Measurement model results

<table>
<thead>
<tr>
<th>Construct name</th>
<th>Construct items</th>
<th>Factor loadings</th>
<th>t-values</th>
<th>Cronbach’s alpha (CA)</th>
<th>Composite reliability (CR)</th>
<th>Average variance extracted AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier integration intensity</td>
<td>SII_1</td>
<td>0.792</td>
<td>12.220</td>
<td>0.889</td>
<td>0.915</td>
<td>0.643</td>
</tr>
<tr>
<td></td>
<td>SII_2</td>
<td>0.739</td>
<td>8.419</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SII_3</td>
<td>0.836</td>
<td>11.105</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SII_4</td>
<td>0.807</td>
<td>8.764</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SII_5</td>
<td>0.851</td>
<td>14.502</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SII_6</td>
<td>0.779</td>
<td>11.656</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience</td>
<td>EXP_1</td>
<td>0.877</td>
<td>3.166</td>
<td>0.524</td>
<td>0.804</td>
<td>0.674</td>
</tr>
<tr>
<td></td>
<td>EXP_2</td>
<td>0.761</td>
<td>2.813</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency</td>
<td>DEP_1</td>
<td>0.760</td>
<td>4.500</td>
<td>0.713</td>
<td>0.815</td>
<td>0.525</td>
</tr>
<tr>
<td></td>
<td>DEP_2</td>
<td>0.707</td>
<td>4.016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DEP_3</td>
<td>0.762</td>
<td>3.891</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DEP_4</td>
<td>0.664</td>
<td>3.315</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product importance</td>
<td>PI_1</td>
<td>0.669</td>
<td>4.751</td>
<td>0.790</td>
<td>0.856</td>
<td>0.545</td>
</tr>
<tr>
<td></td>
<td>PI_2</td>
<td>0.717</td>
<td>7.123</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PI_3</td>
<td>0.722</td>
<td>7.992</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PI_4</td>
<td>0.799</td>
<td>12.668</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PI_5</td>
<td>0.776</td>
<td>11.671</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process results</td>
<td>PR_1</td>
<td>0.833</td>
<td>12.517</td>
<td>0.790</td>
<td>0.875</td>
<td>0.700</td>
</tr>
<tr>
<td></td>
<td>PR_2</td>
<td>0.774</td>
<td>7.514</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PR_3</td>
<td>0.899</td>
<td>21.603</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output results</td>
<td>OR_1</td>
<td>0.641</td>
<td>3.774</td>
<td>0.856</td>
<td>0.886</td>
<td>0.529</td>
</tr>
<tr>
<td></td>
<td>OR_2</td>
<td>0.771</td>
<td>7.102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR_3</td>
<td>0.618</td>
<td>4.222</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR_4</td>
<td>0.840</td>
<td>12.564</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR_5</td>
<td>0.778</td>
<td>11.216</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR_6</td>
<td>0.768</td>
<td>8.798</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR_7</td>
<td>0.647</td>
<td>4.302</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Fornell–Larcker criterion—discriminant validity test

<table>
<thead>
<tr>
<th>Dependency</th>
<th>Experience</th>
<th>Output results</th>
<th>Process results</th>
<th>Product importance</th>
<th>Supplier integration intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependency</td>
<td>0.724</td>
<td>0.405</td>
<td>0.273</td>
<td>0.249</td>
<td>0.093</td>
</tr>
<tr>
<td>Experience</td>
<td></td>
<td>0.821</td>
<td>0.125</td>
<td>0.192</td>
<td>0.093</td>
</tr>
<tr>
<td>Output results</td>
<td>0.273</td>
<td>0.125</td>
<td>0.728</td>
<td>0.594</td>
<td>0.253</td>
</tr>
<tr>
<td>Process results</td>
<td>0.249</td>
<td>0.192</td>
<td>0.594</td>
<td>0.837</td>
<td>0.441</td>
</tr>
<tr>
<td>Product importance</td>
<td>0.093</td>
<td>0.093</td>
<td>0.253</td>
<td>0.278</td>
<td>0.545</td>
</tr>
<tr>
<td>Supplier integration intensity</td>
<td>0.300</td>
<td>0.110</td>
<td>0.396</td>
<td>0.441</td>
<td>0.545</td>
</tr>
</tbody>
</table>

Numbers below the diagonal display correlation between each construct; numbers on the diagonal represent the squared Average variance extracted (AVE).

Analysis and results

Structural model evaluation

Table 3: Values of $R^2$ and the Stone–Geisser coefficient $Q^2$

<table>
<thead>
<tr>
<th></th>
<th>$R^2$</th>
<th>$Q^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output results</td>
<td>0.157</td>
<td>0.060</td>
</tr>
<tr>
<td>Process results</td>
<td>0.194</td>
<td>0.112</td>
</tr>
<tr>
<td>Supplier integration intensity</td>
<td>0.361</td>
<td>0.195</td>
</tr>
</tbody>
</table>

We tested the forecast performance of the structural model. The Stone–Geisser coefficient, $Q^2$, was analysed by applying the blindfolding process; the output reveals that all cross-validated construct redundancy $Q^2$ values were over the threshold level of 0 (Hair et al. 2012). We also estimated $R^2$ values to examine construct validity. The $R^2$ values for output results, process results and supplier integration intensity are 0.060, 0.112 and 0.195, respectively, showing that the conceptual model can explicate 6.0, 11.2 and 19.5 percent of the variance, respectively.
Evaluation of hypotheses

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Relationship</th>
<th>Path coefficient ( \beta )</th>
<th>( t )-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Dependency ( \rightarrow ) Supplier integration intensity</td>
<td>0.270</td>
<td>2.407</td>
<td>*</td>
</tr>
<tr>
<td>H2</td>
<td>Experience ( \rightarrow ) Supplier integration Intensity</td>
<td>-0.048</td>
<td>0.538</td>
<td>n.s.</td>
</tr>
<tr>
<td>H3</td>
<td>Product importance ( \rightarrow ) Supplier integration intensity</td>
<td>0.524</td>
<td>4.888</td>
<td>****</td>
</tr>
<tr>
<td>H4</td>
<td>Supplier integration intensity ( \rightarrow ) Output results</td>
<td>0.396</td>
<td>3.932</td>
<td>****</td>
</tr>
<tr>
<td>H5</td>
<td>Supplier integration intensity ( \rightarrow ) Process results</td>
<td>0.441</td>
<td>4.054</td>
<td>****</td>
</tr>
</tbody>
</table>

Significance test (two-tailed):
- n.s. = non-significant
- * \( p \leq .10 \)
- ** \( p \leq .05 \)
- *** \( p \leq .01 \)
- **** \( p \leq .001 \)

To analyse the structural model, the \( R^2 \) values and path coefficients were evaluated (Table 4). The structural model evaluation results show that dependency and product importance have a significant positive impact on supplier integration intensity, supporting H1 and H3 (\( \beta = 0.270 \),\( t \)-value = 2.407; \( \beta = 0.524 \), \( t \)-value = 4.888). Furthermore, experience between SME and supplier had no significant positive effect on supplier integration intensity, not supporting H2 (\( \beta = -0.048 \), \( t \)-value = 0.538). Additionally, supplier integration intensity has a strong effect on output results and process results, shown by the path coefficient of 0.396 and 0.441 (\( t \)-values = 3.932 and 4.054), supporting H4 and H5.

Conclusion

Managerial perspective

This research reveals the intensity level to which suppliers should be involved in SME’s innovation process. The results show that if SME–supplier dependency is high, the SME–Supplier relationship should be more intense. Also, the more important the supplier component is for the SME, the stronger the SME–supplier relationship ought to be; in this situation, a deep collaboration is desirable. Our research results reveal that an intense SME–supplier collaboration has a positive influence on the innovation output and process outcomes.

Theoretical perspective

Supplier collaboration in innovation activities has been discussed by various scholars (e.g. Johnsen, 2009). However, there is a lack of research concerning the role of supplier on SMEs’ innovation process. This research study explores several factors which influence the intense SME–supplier relationship, such as interdependency between SME and supplier, experience,
and product importance. Furthermore, it also focuses on the outcome of a deeper SME–supplier relationship on innovation results.

Limitations and further research

Each research project has limits, which leads to additional investigation. In this study, data were collected from SMEs. Additional information from the supplier side could be helpful to reveal suppliers’ views within the model. Another constraint is that the data were gathered from a single person within each SME. To obtain better results and avoid introducing biases from a single perspective view, several respondents from the same SME would help to validate the results. Additionally, the application of PLS–SEM has some restrictions, and the use of other statistical methods could help to overcome this limitation (Rönkkö and Evermann, 2013).
References


Economics is considered as the Queen of all social sciences. The reason of this is the power of economics in explaining social issues and the major role of the economics in the relations between other disciplines. Economics necessarily focused on policy, rather than discovery of fundamentals. This focus generate real problems in economics. The practical policy aspect of economics may be important but it should not be its sole function. Economic issues should be evaluated not only in terms of policy but also in more holistic and different ways. And this book serials “Economic Issues in Retrospect and Prospect” is intended to achieve such an approach. It adresses key issues in political economy ranging from micro and macro economics, to monetary economics, gender economics, development economics, health economics etc. Bringing together successful academicians in the field, this book aims to create new discussion lines and topics in economics.